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Swine Paratyphoid in Northern Ireland

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The purpose of this article is to describe a disease of swine which is responsible for considerable loss to pig breeders in Northern Ireland. Many papers on swine paratyphoid have appeared in continental journals, but the scope of this article is confined to observations made in Northern Ireland.

DEFINITION.—This is an infectious disease of swine caused by an organism of the Salmonella group and associated with diarrhoea, wasting and pneumonia.

DISTRIBUTION.—Some thirty outbreaks of this condition have been investigated within widely separated areas.

LOSSES.—It is difficult to put an exact figure on the loss resulting from this disease. In some outbreaks not more than 5 per cent. or 10 per cent. of the pigs may die, but in individual litters the loss may approximate to 100 per cent. Where this disease makes its appearance it takes its toll in sickness and loss of condition apart from the mortality it produces.

ETIOLOGY.—An organism belonging to the Salmonella group of organisms has been isolated in the course of *post-mortem* examinations conducted on all outbreaks investigated. The organism is a non-sporulating, motile, Gram-negative, aerobic bacillus. Morphologically it is pleomorphic, cocco-bacillary to bacillary forms being commonly present in any one field.

The following are the sugar reactions. Acid and gas are produced in dextrose, maltose, mannite, laevulose, galactose, xylose and rhamnose, acid and gas are sometimes produced in sorbite and slight acid sometimes in saccharose and dextrin.

It is negative to lactose, arabinose, raffinose, inulin, starch, glyogen, amygdalin, salicin, glycerine, erythrite, adonite, dulcite and inosite.

In response to our request the Imperial Bureau of Animal Health very kindly compiled the information contained in Table 1, which we reproduce with their permission.

TABLE I

Salmonella Committee's Nomenclature.	Antigenic Structure.	Fermentation Reaction.									
		Dextrose.	Maltose.	Mannite.	Xylose.	Inosite.	Arabinose.	Dulcite.	Rhamnose.	H_2S	Litmus Milk.
S. paratyphi-C ...	VI, VII, c 1.4.5.	AG	AG	AG	AG	—	AG	AG	Late AG	+	a–alk
S. cholerae-suis ...	VI, VII, c 1.3.4.5.	AG	AG	AG	AG	—	—	–/a	AG	+	a–alk
S. cholerae-suis ... (Kunzendorf)	VI, VII, 1.3.4.5.	AG	AG	AG	AG	—	—	–/a	AG	—	a–alk
S. typhi-suis ...	VI, VII, c 1.3.4.5.	Ag/A	Ag/A	—	Ag/A	—	Ag/A	Ag/A	Ag/A	+	a
S. typhi-suis ... (Voldagsen)	VI, VII, 1.3.4.5.	Ag/A	Ag/A	—	Ag/A	—	Ag/A	Ag/A	Ag/A	+	a
Northern Ireland Salmonella		AG	AG	AG	AG	—	—	—	AG		a–alk

AG = acid and gas.
Ag/A = usually acid and small amount of gas, or no gas.
a–alk = faint initial acidity followed by alkalinity.
a = slight production of acid often delayed.
–/a = usually negative but occasionally a slight amount of acid appearing perhaps after several days.

The organism with which we have been working has been added to this table to render comparison more easy. The close agreement between the organism isolated in Northern Ireland and *S. cholerae-suis* (Kunzendorf) will be noted.

Pathogenicity.—The organism on subcutaneous injection causes death in rabbits in from four to six days and in mice from two to four days, death in each case resulting from septicaemia. It is non-pathogenic to guinea-pigs and pigeons. Its effect on pigs is referred to later.

It may be mentioned that recently isolated cultures appear to be more virulent than those subcultured for several generations.

Symptoms

This disease is met with in pigs up to 24 weeks old, but is more common in pigs between the ages of 16 and 22 weeks.

Different types of the disease are met with and these follow closely a fairly definite age incidence, but it will be realised that exceptions can and do occur.

Type I.—The disease, in our experience, is not of common occurrence in young suckling pigs, but when it does occur, characteristic symptoms are shown. The most noteworthy of these is a bluish or purplish discoloration of the extremities—ears, tail and feet. The ears, however, are most commonly affected. The discoloration commences at the tip of the ear and increases until almost the whole ear is involved. This discoloration may appear in a relatively short period (a few hours) and it has been known to disappear in two instances in as many minutes. Temperatures of 106° F. and 107° F. are common and affected pigs have a dull greyish appearance. In cases of this kind which have recovered, the tip of the ear and tail have been observed to slough.

Type II.—The disease as it occurs in pigs between the ages of eight to fourteen weeks takes the form of a necrotic enteritis characterised by diarrhoea and wasting. Affected pigs become greyish and are unthrifty looking, they often survive until they are much emaciated ("piners"). Temperatures may vary from 104° F. to 106° F., depending on the severity of the attack. An affected pig in a pen can easily be recognised by its dull, dejected look and soiled hind quarters. Symptoms of pneumonia are often observed, but cases of necrotic enteritis have been met with without lesions of pneumonia being found. The mortality rate varies; from 20 to 80 per cent. of affected pigs die and the survivors remain unthrifty.

Type III.—This type occurs principally in older pigs from 16 to 24 weeks of age. The characteristic feature in these cases is pneumonia. Necrotic enteritis is not often found in pigs of this age. The first symptom noted is that the pig is dull and disinclined to feed, and soon ignores feeding time. High temperatures are common, 106° F., 107° F. and 108° F. being often recorded. The skin becomes greyish with the bristly hair prominent. In a day or two "blowing" symptoms are noticed, *i.e.* a heaving or in-and-out movement of the flank which appears almost like a thumping movement. This pneumonia generally proves fatal in two or three days. In very acute cases death may result in 24 hours following the appearance of the "blowing" symptoms.

Type IV.—Acute cases are met with, the only observable feature being dullness and a high temperature, death resulting in a day or two and apparently taking place so quickly that none of the characteristic features has time to develop. These cases are more common in piglets a few weeks old.

Type V.—Cases have been met with in which a peculiar skin rash has been present. This skin condition is somewhat like ringworm but is dirtier in appearance and more "scabby." It is widely distributed over the body. The scabs appear first inside the thighs and fore-legs and on the abdomen and spread up the flanks to the back. Affected pigs, which are usually between eight and fourteen weeks old, have a decidedly dirty scabby appearance. Examination of skin scrapings failed to show any evidence of the ringworm fungus. The usual ringworm treatments have been tried without success. The mortality rate is high, up to 50 per cent. of affected pigs succumbing. At *post-mortem* examination the Salmonella organism described has been recovered from the liver and heart blood.

Bacteriological Findings

An organism belonging to the Salmonella group has been isolated from all the types described. This organism appears to be *S. cholerae-suis* (Kunzendorf).

In type I this organism has been isolated from all the organs.

In type II it has been isolated from the intestinal contents and from the intestinal wall, and, occasionally, from the liver. In cases complicated with pneumonia the organism has been isolated from the lungs.

In types III, IV and V the organism has been isolated from all organs.

Pathological Findings

Type I.—Enlargement and congestion of the spleen and liver are noted. Small haemorrhages varying from pin-point size to that of peas may be noted in the kidneys, lungs and myocardium.

Type II.—Lesions are confined to the bowel in this form as a rule and are characterized by necrosis and diphtheresis of the mucous mem-

brane of the large intestine. The intestinal wall becomes thickened and leather-like. Generally this necrotic enteritis involves the caecum and major portion of the large intestine, the mucous membrane being almost entirely replaced with cheesy-looking diphtheritic material. The diphtheritic material in places may be pigmented black. Firm "button-like" ulcers, somewhat similar to those found in swine fever, have been found in this disease but are not of common occurrence.

Type III.—Advanced lesions of pneumonia are the principal findings in this type. The extent of these varies, but generally the anterior and dependent lobes of the lung are involved. In many cases almost two-thirds of the lung tissue have been consolidated—not unlike lymphoid tissue on naked-eye appearance. On section the consolidated lung has a moist appearance and fluid oozes from the cut surface. We are not prepared to state that the paratyphoid organism is the primary cause of this pneumonia, as grey hepatisation is a very common *post-mortem* finding in pigs. Necrotic enteritis may be found but is not common, in our experience, in pigs of this age.

Type IV.—Enlargement and congestion of the liver and spleen are commonly noted. Petechial haemorrhages are often present in the kidneys, myocardium and occasionally in the lungs. The haemorrhages in the kidneys may vary from those of pin-point size to quite extensive areas.

Type V.—The "scabby" dirty appearance of the skin is the most noteworthy feature. Usually there is enlargement of the spleen and liver and evidence of pneumonia. The subcutaneous glands are always very much enlarged.

Experiments with the Organism

(1) The various strains isolated from each outbreak have proved pathogenic for rabbits in from four to six days, death resulting from septicaemia. The organism is also pathogenic for mice but not for guinea-pigs or pigeons.

(2) Two pigs, eight weeks old, were fed daily for a 14-day period with a fresh culture of the organism washed off a trypsin agar slope with normal saline. Within 24 hours of the first feeding the pigs commenced to scour. Scouring became very severe and the pigs rapidly lost condition and became emaciated. One pig died on the fourteenth day. At this stage the feeding of the culture to the surviving pig was discontinued. The scouring in this pig gradually ceased and the animal began to improve. The pig was killed about four months later in good condition and no evidence of disease was found.

Post-mortem examination of the pig which died showed severe necrotic enteritis and gastritis. Culturally the organism was recovered from the bowel but not from the liver or spleen. Pneumonia was not present.

(3) Two pigs twelve weeks old were fed a fresh culture periodically. On the day following the feeding, diarrhoea was always observed. If the addition of the culture to the food were suspended for an interval of three or four days the diarrhoea gradually ceased, to reappear again when the culture was again added. This intermittent feeding of pure culture was practised for one month, and a few days after the feeding of culture was discontinued the diarrhoea stopped and the pigs returned to normal. The pigs were killed when 24 weeks old and no evidence of disease was found.

(4) Two pigs twelve weeks old received 1 c.c. of a heavy suspension of the organism in saline, intravenously. Both pigs experienced an acute febrile attack with temperatures of 106° F. and over, on the day following the injection. One pig died on the third day from septicaemia and cultures sown from the liver, spleen, heart blood, kidneys and intestinal glands yielded pure cultures in each case. There were no intestinal lesions.

The surviving pig was acutely ill for seven days. Its ears and other extremities became purplish. It gradually recovered strength and after about three weeks was back to normal. A *post-mortem* examination on this pig, killed when 24 weeks old, failed to show any evidence of disease.

(5) Two pigs aged twelve weeks were injected subcutaneously with 1 c.c of a heavy suspension of the organism. These pigs were ill and disinclined to feed for a few days. They made a complete recovery and were killed when 24 weeks old. No evidence of disease was found on *post-mortem* examination.

(6) Two pigs aged twelve weeks received an injection of 1 c.c. of a heavy emulsion of the organism, intrathoracically. The pigs were ill for seven days following the injection. As might be expected, there was evidence of pneumonia. The pigs coughed a good deal and showed "blowing" symptoms. These symptoms gradually disappeared although an occasional cough was heard until the pigs were killed three months later. On *post-mortem* examination a small pleuritic area was present apparently at the site of inoculation in both pigs. A small area of grey hepatisation was present in the apical lobe of a lung of one of the pigs. No other evidence of disease was found.

(7) Two pigs aged five weeks were injected subcutaneously with 1 c.c. of an emulsion of the organism. Both pigs became acutely ill, their temperatures reaching 106° F. and 107° F. One pig died on the fifth day. *Post-mortem* examination disclosed a large congested liver and spleen. Small haemorrhages were present in the kidneys

and heart. In the cortex of the kidneys haemorrhages as large as small peas were present. The intestine was particularly interesting—the entire caecum and large intestine were affected with a well-developed necrotic enteritis. The mucous membrane of the last two or three feet of the small intestine showed an area of acute inflammation about half an inch broad and extending like a livid weal along this portion of the intestine. Slight gastritis was present. The lungs appeared normal. Culturally, the organism was recovered from all organs. The second pig gradually lost condition and while the febrile condition subsided a foul-smelling scour developed. This pig died in six weeks. *Post-mortem* examination disclosed enlargement of the spleen and congestion of the liver. The lungs were the seat of a greyish-looking hepatisation. This was quite extensive, almost half of the lung substance being involved. The caecum and large intestine were affected with a very severe necrotic enteritis; two blackish-looking, raised button-like areas were present in the caecum entirely surrounded by necrotic enteritis—these areas somewhat resembled swine fever "button" ulcers. Culturally the same organism was recovered from the lungs, liver, spleen, intestine and intestinal lymph glands.

Control Pigs.—Two twelve-weeks-old pigs and two five-weeks-old pigs from the same litters as the pigs used in the experiments, were retained as controls on these. No evidence of disease developed in these at any time. They were quite healthy and free from lesions when slaughtered three months later. None of the pigs used was injected subsequently with swine fever virus to determine its susceptibility to swine fever.

(8) Three piglets acutely affected with the disease and selected from a litter in which four deaths had already occurred with lesions of acute septicaemia were removed to the laboratory. Two of the piglets died on the way. Blood was collected from the surviving pig which was almost on the point of death. Two pigs five weeks old were each injected with 5 c.c. of this citrated blood. Two other pigs five weeks old were injected with filtrate obtained by laking the whole blood with distilled water and filtering through large Seitz filters (whole blood one, distilled water three). Each pig received 10 c.c. filtrate. These four pigs were examined daily and their temperatures recorded. The pigs showed no reaction whatever to the injection and remained healthy for six weeks, when they were killed and submitted to *post-mortem* examination. No evidence of disease was found in any of the pigs.

Note.—The three piglets, one of which supplied the blood for this experiment, were affected with acute salmonella type infection and blood cultures were positive in each case. This point is emphasised, as one would have anticipated that the two pigs receiving the citrated whole blood would have developed a similar attack.

(9) Another piglet showing acute symptoms was selected from the farm where the piglets used in the previous experiment were obtained. Whole blood from this piglet was collected and heparinised to prevent clotting. Two piglets eight weeks old were each injected with 5 c.c. of this blood, subcutaneously. Two other pigs received 10 c.c. of a one in three filtrate in distilled water (Seitz filter). These four pigs remained perfectly healthy and were slaughtered fat four to five months later. No evidence of disease was found at *post-mortem* examination.

Two eight-weeks-old pigs and two five-weeks-old pigs from the same litters as the pigs used in the experiments were retained as a check on these. No evidence of disease developed in these pigs at any time and they were quite healthy and free from lesions when slaughtered.

(10) An emulsion in normal saline was made from the spleen, kidneys, liver, heart and bowel of a pig which had died showing necrotic enteritis and in which there was definite ulceration of the bowel. Two pigs four weeks old were injected subcutaneously behind the ear with 5 c.c. of this emulsion with negative results beyond abscess formation at the site of inoculation. At the same time we were able to get 20 c.c. of this emulsion through a large Seitz filter and two more pigs received 10 c.c. of filtrate subcutaneously, again with completely negative results.

(11) Experiment (10) was repeated a week later with similar material from a pig which had wasted away and showed some necrotic enteritis along with severe pneumonia. Pieces of pneumonic lung were added to the emulsion in this case. No evidence of disease developed in these experimental pigs and at *post-mortem* examination five months later they were found to be free from evidence of disease.

Observations.

(1) Paratyphoid disease in pigs is not always an acutely infectious disease. Certain factors appear to be required to make it so. The experiments described above show this, and bear out the course of the disease as it has appeared on the farms where it has been investigated.

(2) This disease can exist on farms where pigs are kept under good hygienic conditions and where feeding is on scientific lines. Only on two of the farms was the hygiene poor.

(3) Experimentally we have produced all the forms of the disease as described, but not with 100 per cent. success.

(4) Bowel lesions simulating the "button" ulcers of swine fever have been found in connection with this disease, but are by no means of common occurrence.

(5) We have satisfied ourselves that swine

fever has not co-existed with this disease on the farms where investigations have been made since:—

(*a*) This disease has a definite age incidence. On none of the farms have any sows died nor any pigs over 24 weeks old. It should be mentioned that on three of the farms the stock at any time would include over 1,000 pigs over 24 weeks old.

(*b*) Very young suckling pigs from birth to four weeks old rarely develop the disease although acute cases have appeared in neighbouring pens.

(*c*) It is exceptional to find entire litters affected. Usually no more than three or four pigs in a litter show evidence of disease.

(*d*) It is unusual to find intestinal lesions in pigs over 20 weeks old.

(*e*) Four small pigs have been inoculated with whole blood and four with blood filtrate from acutely affected pigs with negative results.

(*f*) Eight pigs approximately four weeks old were injected subcutaneously—four with emulsions made from the spleen, kidneys, liver, heart and bowel, of two pigs dead from necrotic enteritis and four with filtrates made from that emulsion. In all cases the pigs remained healthy after injection.

Further Observations.

Observing from these experiments that it was possible only to reproduce the disease experimentally in about 50 per cent. of cases, we were forced to conclude that some factor or factors were essential for this organism to assume pathogenic properties. It has been reported (M'Fadyean, 1933) that bad hygiene is a common predisposing factor. We, therefore, began to carry out severe sanitary measures on one of the farms where there has been trouble from paratyphoid infection for some years. Every possible means of disinfection was practised on this farm; every house was scraped and then hosed down with a high pressure hose and liberally disinfected and washed immediately it was vacated by a batch of pigs; the sows and pigs themselves were washed every week; separate drinking bowls were put into each pen; the manure was cleaned out thoroughly every day; generally the pigs and houses were attended to, to a point of complete impracticability on any average farm. In spite of these precautions there was only a very slight reduction, if any, in mortality from paratyphoid disease. Combined with these sanitary arrangements, every conceivable source of chill or draughts was eliminated. The pigs were thus housed in warm comfortable clean houses and the feeding was on scientific lines but these precautions did little to lessen the toll of this disease. We should, however, mention that pneumonia apart from paratyphoid infection is of common occurrence on these farms.

On another farm it was suspected that anaemia might have predisposed to the paratyphoid infection. An experiment was instituted on this farm in which six litters received daily doses of sulphate of iron and copper mixture while six litters received no treatment of any kind. Anaemia developed in all the pigs in the six non-treated litters, but except that it was amongst the anaemic pigs that the first deaths occurred, the number of deaths was almost identical in both groups. One point which was observed during the course of this experiment was that paratyphoid did not affect the iron group seriously until the pigs were up to 20 weeks old and then the principal finding was an extensive pneumonia, the paratyphoid organism being isolated in every case from the consolidated lung areas.

Vaccines have been found of no value in the control of this disease. Both formalised and heat killed broth cultures of the organism have been used. The opacity of the vaccine corresponded to No. 10 tube of the McFarland Nephelometer. Large groups of pigs were used (in no instance less than 100 pigs). The initial dose of vaccine was 1 c.c., increasing gradually up to 10 c.c. In the first series of experiments the initial dose of vaccine was given at birth and repeated every 14 days until the pigs were weaned. In a second series of vaccine experiments vaccinations commenced at weaning and were repeated every 14 days until the pigs were 24 weeks old. Suitable control groups were left. Both control and vaccinated groups developed the disease almost identically but it was observed that vaccination of the suckling pigs reduced the losses during the suckling period from the acute form almost completely, and from the skin type by approximately 75 per cent. Fewer cases of necrotic enteritis were also met with. The losses, however, were merely postponed as actually the number of pigs dying or slaughtered suffering from pneumonia at from 16 to 24 weeks old was much greater than in the control groups. The losses in both groups from birth to slaughtered as fat were 39 per cent. in the vaccinated group and 42 per cent. in the control group.

Conclusions

There exists in Northern Ireland a disease of pigs caused by the paratyphoid (Kunzendorf) organism. We have been able to reproduce all the forms of the disease by direct inoculation of cultures into healthy pigs, with approximately 50 per cent. success, although only in one instance were lesions of pneumonia found.

It would appear that certain predisposing factors must be present before the disease develops. By the injection into experimental pigs of blood and emulsion of organs from diseased pigs without setting up symptoms of

(*Concluded at foot of col.* 1, *page* 254.)

FOOT-AND-MOUTH DISEASE

MINISTRY OF AGRICULTURE MEMORANDUM*

The following memorandum on foot-and-mouth disease deals with: (1) the character and history of the disease; (2) the policy and procedure for dealing with outbreaks in Great Britain; (3) details of outbreaks, October-November, 1937; (4) the measures taken to prevent the introduction of infection from abroad; (5) research; and (6) the export trade in pedigree stock in relation to the disease.

1. Character of the Disease.—Foot-and-mouth disease is caused by a virus which passes through all known filters, and which cannot be seen even with the aid of the most powerful microscope. It is not usually fatal to the animals attacked, as the proportion of deaths does not normally exceed 3 per cent. in the case of cattle, with a rather higher figure amongst sheep and pigs. In the case of young unweaned animals, however, the mortality is frequently very high. Although the disease is curable, it has secondary consequences which are often serious, especially amongst dairy herds and breeding stock. The real trouble with foot-and-mouth disease is not its deadliness but its extraordinary infectivity, against which there is no known preventive agent. It is spread not only direct from animal to animal but also through many intermediate agencies, including human beings, vehicles, feeding utensils, packing materials, and even rodents and birds. Every diseased animal is an active manufacturer of virus, which can be carried by these means with great rapidity. Movement, both human and animal, is now much more extended than it used to be, and infection would constantly be carried from one part of the country to another if affected animals were kept alive for treatment. Unfortunately, a diseased animal has only a very short immunity against another attack, and although the actual losses by death might not in themselves be disastrous, the total financial loss which would be suffered by breeders and dairy farmers, if once foot-and-mouth disease were allowed to become endemic, would be enormous, and all stock-owners would be faced with a constantly recurring menace, to say nothing of the effect on the export of British pedigree stock, which is of such high importance not only to breeders in this country, but to the meat and wool trade of the world.

2. History of Disease in Great Britain.—According to the records, foot-and-mouth disease first appeared in England in 1839, and from that date until 1892 the country suffered from considerable periods of severe infection. In 1862 the disease broke out in the Royal Agricultural Society's show-yard at Battersea, and in 1863 animals were attacked in the Smithfield Show. In 1871, 52,000 outbreaks were officially reported and in this visitation, which continued into the following year, the number of animals attacked was estimated at about three millions. From 1880-84, 27,445 outbreaks with some 800,000 animals affected are recorded.

Notifiable from 1869.—The disease was first made notifiable by the Contagious Diseases (Animals) Act, 1869, but the powers conferred thereby upon local authorities were permissive and not obligatory, and for some years stock-owners were opposed to any compulsory measures for the suppression of the disease. Agricultural opinion gradually grew, however, in favour of drastic measures on the lines of those adopted against cattle plague (rinderpest), including the adoption of the slaughter policy by means of which that disease was finally eradicated in 1877.

Slaughter Policy Introduced in 1892.—It was not until 1892, however, that the power to adopt a slaughter policy was conferred upon the Ministry of Agriculture by the Contagious Diseases (Animals) Act, 1892. The objects aimed at by legislative action in Great Britain since that date have been:—

(*a*) to eradicate the disease wherever it appears by the application of the power to slaughter, and
(*b*) to protect the country by every practicable means against the introduction of infection from outside sources.

From 1892 until 1922 the number of outbreaks did not exceed 95 in any one year. The year 1922 and the two following years, however, witnessed a severe test of the slaughter policy as a means of preventing the disease from again becoming endemic, but success was eventually achieved. The outbreaks from 1922, the number of counties affected, the extent of slaughter, and the annual cost of compensation for slaughtered animals are as given in the table at the top of page 255.

In view of the present organisation and procedure for dealing with this disease it is hoped that the experience of the years 1922-24 will never be repeated. Omitting these exceptional years the total expenditure on compensation for slaughtered animals during the years 1925 to 1937 (inclusive) has been £1,221,541. or an average of £93,965 per annum. Assuming the total value of the cattle, sheep and pigs in Great Britain to be roughly £150,000,000, this is an equivalent to the payment of an insurance premium of 1s. 3d. per cent. per annum to insure

*Memorandum dated December 15th, 1937. Reproduced, by permission, from the *Journal of Ministry of Agriculture and Fisheries*, 44. 10. January, 1938, together with statistical data furnished, since publication, by the Ministry.

disease we have eliminated the possibility of swine fever as the predisposing agent. We were unable to produce disease, either swine fever or paratyphoid disease, in any of these experimental pigs even though the blood and tissues used for inoculation gave pure cultures of the paratyphoid organisms. This is an interesting fact, the significance of which is being investigated. Emulsions filtered through a Seitz filter also failed to produce evidence of disease.

Anaemia and bad hygiene by lowering the vitality of the pigs may play a part in the development of this disease, but our experiments indicate that these factors are of minor importance. It may be that the factors which lead to the development of pneumonia in pigs are of primary importance in connection with swine paratyphoid. A paper by Radtke (1937) on Piglet Influenza supports this view.

References

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Outbreaks of Foot-and-Mouth Disease, 1922 to 1937, Animals Slaughtered and Cost of Compensation.

Calendar Year.	Counties Affected.	No. of Outbreaks.	No. of Animals Slaughtered.					Net Cost of Compensation for Animals Slaughtered.
			Cattle.	Sheep.	Pigs.	Goats.	Total.	
								£
1922 ...	46	1,140	24,071	21,831	9,821	49	55,772	647,627
1923 ...	43	1,929	69,256	26,170	33,304	55	128,785	1,898,211
1924 ...	52	1,440	42,737	28,362	17,548	79	88,726	1,123,194
1925 ...	26	260	8,512	8,440	2,978	33	19,963	233,784
1926 ...	31	204	5,773	11,671	2,547	11	20,002	172,464
1927 ...	23	143	4,624	3,496	1,813	7	9,940	120,467
1928 ...	21	138	4,129	5,069	2,227	16	11,441	112,632
1929 ...	15	38	1,247	1,101	1,217	5	3,570	36,376
1930 ...	3	8	42	67	195	2	306	1,626
1931 ...	19	97	3,698	5,563	1,384	4	10,649	96,454
1932 ...	11	25	629	1,608	416	—	2,653	16,521
1933 ...	23	87	3,359	3,084	1,359	3	7,805	72,399
1934 ...	15	79	2,724	5,173	2,378	27	10,302	63,367
1935 ...	12	56	2,900	7,000	2,543	1	12,444	71,697
1936 ...	14	67	2,504	1,737	1,072	3	5,316	52,480
1937 to Dec. 9	21	117	5,430	11,010	5,170	8	21,618	171,274
				Total net cost of compensation ...				£4,890,573

this country by means of the slaughter policy against the risk of the disease becoming endemic.

The average annual number of animals slaughtered during the same years (1925-1937) is 3,505 cattle, 5,001 sheep and 1,946 pigs. As a percentage of the total animal population of Great Britain returned in June, 1937, these figures work out at about 0·04 per cent. of the cattle, 0·02 per cent. of the sheep, and 0·05 per cent. of the pigs; or in other words four per 10,000 cattle, two per 10,000 sheep and five per 10,000 pigs have been slaughtered annually on the average in pursuance of the slaughter policy.

Regarded in the perspective of past history, the extent of the present outbreak (October-November, 1937) dealt with in paragraph 7 of this memorandum, although serious in view of the extreme infectivity of the disease and the manner of its introduction, is not comparable with those of 1922 to 1926.

3. Procedure Adopted in Outbreaks in Great Britain.—The procedure now adopted in dealing with outbreaks which is described in paragraphs 3 to 6 of this memorandum, has been built up from past experience and embodies the principal recommendations of two Departmental Committees appointed in 1922 and 1924.

Whenever foot-and-mouth disease is suspected to exist on any premises in Great Britain, the owner or person in charge is required by law immediately to notify the fact to the local police, who are required at once to inform the Ministry by telegram, and also the local authority concerned, whose duty it is to cause a notice to be served upon the occupier of the premises, the effect of which is to apply thereto the Rules to be observed on an infected place to prevent the spread of infection. A veterinary inspector is at once instructed by the Ministry to make a diagnostic enquiry. Officers are on duty day and night available to issue these instructions so that there may be no delay in diagnosis. If the inspector, after examining the animal or carcase, suspects that disease exists he is required to issue a certificate to that effect and notify the local authority, the local police and station master, whereupon the movement of animals out of, into or within an area lying within a radius of five miles of the premises concerned is automatically prohibited pending a definite and conclusive diagnosis by the chief veterinary officer of the Ministry to whom the veterinary inspector's report is communicated by telephone. The five-mile emergency area may if necessary be extended to 15 miles or more.

4. The Slaughter Policy.—The slaughter policy, which is the established policy in this country in dealing with this disease, involves the immediate slaughter, on confirmation of the existence of the disease, of all affected animals (cattle, sheep, swine or goats), and also those which are or have been recently in contact with the affected animals or otherwise directly exposed to infection. The object of such slaughter is to destroy as quickly as possible the manufacturers, and potential manufacturers, of the foot-and-mouth disease virus which is so easily and rapidly spread from animal to animal and carried by numerous agencies acting as mechanical carriers to the stock of other farms. The slaughter of the stock on an infected place is normally completed within 24 hours of the report of the case being received in the Ministry of Agriculture. Dogs, cats or poultry, are not slaughtered, but those on infected premises are confined. Preliminary disinfection is proceeded with immediately and a thorough disinfection of the whole premises is carried out as soon as slaughter has been completed. Infected premises are subject to special rules referred to in paragraph 3, including prohibition of movement of live animals on or off the premises, and of entry of persons other than attendants or veterinary inspectors, and disinfection of all persons and vehicles entering and leaving. These rules are maintained for a period of about nine weeks from the date of slaughter, except that a partial re-stocking is permitted under supervision for the final three weeks of that period.

Opinion of Departmental Committee, 1924-25.—Of the slaughter policy the Departmental Committee appointed in 1924 to investigate the widespread outbreaks of that period, said in their report [Cmd. 2350] (pages 10, 12 and 29):

"The control of foot-and-mouth disease is clearly a matter of national importance."

"The manufacture of virus is on a much greater scale (when isolation instead of slaughter of affected stock is adopted) and continues for a long period, thus multiplying the risk of extension with the ultimate danger of an uncontrollable spread and of the disease becoming endemic in this country."

* * * * *

"The object of the slaughter policy is the destruction of virus and its success depends almost entirely on rapidity of action in removing the source from which virus is being produced. So long as the policy is pursued with unrelenting energy and with the maximum celerity we are convinced that it is at present the only policy unless disease is to become endemic."

* * * * *

"The adoption of isolation as a policy would transfer the burden of direct loss from the nation to the individual but it would undoubtedly react on the nation."

* * * * *

"A policy of isolation would be equivalent in our view to the abandonment of any hope of eradicating the disease from this country."

* * * * *

"We are unshaken in our belief that until a preventive agent is available, the slaughter policy should be continued."

Compensation for Slaughtered Animals.—The statutory authority for the payment of compensation is contained in Section 15 of the diseases of Animals Act, 1894, which lays down that the basis of compensation for slaughtered animals shall be as follows:—

(i) if the animal slaughtered was affected with foot-and-mouth disease the compensation shall be the value of the animal immediately before it became affected;

(ii) in every other case the compensation shall be the value of the animal immediately before it was slaughtered.

The value referred to in the Section is the actual value of the animals whether they be attested, accredited, pedigree or ordinary stock.

Consequential Losses.—The Act makes no provision for the payment of compensation for consequential losses. The Departmental Committee appointed to inquire into the extensive outbreaks of 1923-24 considered the question of the basis of compensation, but made no recommendation on the question of consequential losses. The difficulties are obvious since such losses are suffered not only by the farmers occupying the infected farms, but also livestock auctioneers, market authorities and other owners of stock in infected areas whose ordinary transactions are considerably curtailed, *e.g.*, in the case of store stock, markets are entirely suspended for considerable periods.

5. Infected Area Restrictions.—Concurrently with, and a necessary concomitant of the slaughter policy an infected area is declared by an Order of the Minister immediately an outbreak is confirmed, embracing a radius of 15 miles around the infected premises. No movement of animals out of this area is permitted and movements of animals into and within the area are controlled by licence, only necessary movements being allowed. Markets within the area are limited to fat stock and are permitted by licence and subject to veterinary inspection, but only on premises more than five miles from any infected place. All dogs within five miles of any infected premises have to be kept under control and hunting in the area is prohibited. A warning notice to stock-owners (Leaflet A.129/T.A.) is distributed widely in infected areas indicating the precautions to be taken and requirements to be observed to prevent the spread of infection.

The infected area restrictions are normally maintained in the "15 mile" area for 14 days, when the area is reduced to one of five miles radius from the infected place or places, this reduced area being maintained for a further period of seven days. Variations of this procedure may be necessary in the case of more complicated outbreaks.

The Size of the Infected Area initially declared (a 15 mile radius) has been criticised as being unnecessarily large in dealing with a primary or single farm outbreak. On this question the Departmental Committee of 1924-25 in paragraph 90 of its report (Cmd. 2350) said:—

"It has to be remembered that before the first symptoms of disease were noticed, and any precautions taken, the animals were in a highly infective state for about 48 hours. It is essential, therefore, that until all inquiries as to origin and possible spread of disease before notification have been completed all animals which may reasonably be regarded as having been exposed to contagion should be subject to some form of control. We are unable, therefore, to recommend any reduction in the size of the area to which restrictions are applied in the first instance."

The wisdom of maintaining the 15 mile area has been abundantly proved by experience. Not infrequently subsequent outbreaks have occurred some miles from the first reported case and some of these have been found to be of earlier origin than the one first reported. Whilst a 15 mile radius has included practically all such cases, a smaller area would not have been sufficient for the purpose.

Owner's Power to Prohibit Entry of Unauthorised Persons.—Another point of importance to owners in connection with infected areas is that any owner having animals on premises in such an area may, under Section 13 of the Diseases of Animals Act, 1894, exhibit a notice prohibiting the entry of unauthorised persons into his buildings and lands without his consent. Many stock-owners exercise this power and the Ministry is prepared to provide the notices.

6. Standstill Orders.—In the case of more widely spread outbreaks, such as the present, the above restrictions are supplemented by a temporary "Standstill" Order controlling the movement of animals out of and within an area surrounding the actual infected areas as an additional precaution with the object of limiting the spread of infection.

7. Special Features of Present Outbreak (1937).—The outstanding and most dangerous features of the present outbreak in the south-eastern counties have been its exceptional virulence as shown by the large number of animals initially found affected showing recent lesions at the veterinary inquiry and the large number of entirely unconnected centres of disease which appeared within a comparatively short period.

The present series began on October 16th, at Thurning in Norfolk, and in the course of the eight weeks since that date to December 9th a total of 95 outbreaks were confirmed, distributed amongst 15 counties, all except two being in the south and east of England. The number confirmed each week and their location is given in the following table. Of the 95 outbreaks, Norfolk has had 19, Suffolk 16 and Kent 15, East Sussex, Huntingdonshire and Essex coming next with twelve, eight, and eight outbreaks respectively. The exhaustive inquiries conducted into every outbreak show that some 59 centres and possibly a few more were entirely

LOCATION OF OUTBREAKS OF FOOT-AND-MOUTH DISEASE.*
OCTOBER 16TH TO DECEMBER 9TH, 1937.

County.	Outbreaks during Period.								Total.
	Oct. 16–23.	Oct. 24–30.	Oct. 31–Nov. 6.	Nov. 7–13.	Nov. 14–20.	Nov. 21–27.	Nov. 28–Dec. 4.	Dec. 5–9.	
Norfolk	2	8	6	2	—	1	—	—	19
Suffolk	—	—	4	9	3	—	—	—	16
Sussex (East) ...	—	—	1	1	—	4	2	4	12
„ (West) ...	—	—	—	—	—	1	—	1	2
Kent	—	—	5	3	5	1	—	1	15
Essex	—	—	1	1	2	2	1	1	8
Lindsey	—	—	—	1	2	1	—	—	4
Hunts	—	—	—	2	4	1	1	—	8
Soke of Peterborough	—	—	—	—	1	—	1	—	2
Bucks	—	—	—	—	—	1	—	—	1
Surrey	1	—	—	—	—	—	—	—	1
Cheshire	—	—	—	—	—	—	1	—	1
Dorset	—	—	—	—	—	—	1	—	1
Northumberland ...	—	—	—	—	—	—	1	1	2
Wilts	—	—	—	—	—	—	—	3	3
TOTALS ...	3	8	17	19	17	12	8	11	95

unconnected with any previous outbreak or with each other. Twenty-five of the centres involved the declaration of either new infected areas or extensions of existing infected areas.

Standstill Order (Controlled Area) for South-Eastern Counties.—The rapid increase in the numbers of outbreaks and the fact that the disease, although limited at that time to the southern and eastern counties, was occurring at so many widely separated centres in those counties, created a situation which in the Minister's opinion called for additional precautionary measures to safeguard other parts of the country as far as possible, and on November 9th an Order was issued imposing prohibition of movement of animals out of, and controlling the movements of animals into, and within an area termed a controlled area stretching from the Humber to the Hampshire coast and comprising the counties of Lincoln (parts of Lindsey, Kesteven and Holland), Soke of Peterborough, Huntingdon, Cambridge, Isle of Ely, Norfolk, East and West Suffolk, Essex, Bedford, Hertford, Middlesex, London, Surrey, Kent and East and West Sussex (including any county or other boroughs geographically situated therein), but excluding from the area any parts of such counties and boroughs which were for the time being comprised within any foot-and-mouth disease infected area. In this controlled area livestock markets were limited to licensed markets of fat stock for immediate slaughter only and were subject to veterinary inspection as in infected areas. The progressive improvement in the eastern counties rendered it possible to withdraw the Standstill Order as from December 9th, when the controlled area was accordingly released.

Christmas Arrangements were made as follows:

Smithfield Show.—A Special Order was made on November 22nd authorizing the Smithfield Show (December 6th to 10th) at Islington (in the Controlled Area). Animals were permitted to be moved to the Show from any free area or from the Controlled Area but not from an Infected Area. Movement *from the Show was allowed only to a slaughterhouse* either in the Controlled Area or in any adjoining Infected Area but *not to a free area,* and the animals were required to be slaughtered within 10 days. On the release of the Controlled Area on December 9th, however, these restrictions on movement from the show were revoked.

Christmas Fat Stock Markets.—An Order was issued on November 28th:—

(*a*) permitting any animals sold at licensed fat stock markets in the Controlled Area to be moved back to the place of origin for detention for 14 days during which period they were permitted to be again moved by licence to a slaughterhouse. The object of this was to assist butchers who have insufficient accommodation at their slaughterhouses at one time for the animals they purchase for the Christmas trade;

(*b*) extending the time limit for slaughter of animals moved under licence to a slaughterhouse in the Controlled Area which is normally 4 days, to 10 days.

Interference with Export Trade.—The following lots of animals intended for export were rendered ineligible for entry to the London Quarantine Station in consequence of outbreaks within 15 miles of the place of origin, and shipment had to be abandoned:—

(*a*) nine cattle and 28 sheep for the quarantine period commencing November 11th;

(*b*) one bull, 21 sheep and 2 pigs for the quarantine period commencing November 30th. Four of these sheep were on the farm of H.M. The King at the Home Farm, Sandringham.

(See also paragraph 11 of this Memorandum.)

8. Origin of Infection.—Up to the summer of this year the Continent of Europe had for some two years been freer from foot-and-mouth disease than for a considerable period previously. In June the disease was introduced into France by animals imported from Northern Africa. It spread with exceptional rapidity first in France and then to Belgium, Holland, Germany and Switzerland. The table (*overleaf*)* of outbreaks illustrates its progress in western Europe:—

*See also supplementary table at end.

1937.	France.	Belgium.	Holland.	Germany.
June... ...	789	—	—	2
July ...	2,727	10	2	7
August ...	9,327	319	394	7
September ...	21,970	4,090	11,444	264
October ...	32,808	14,098	—	3,295
November ...	22,655 (to Nov. 15.)	—	—	11,739

The disease thus reached dimensions in these four countries which has not been known for many years, and it is understood that in some parts of the Continent drastic restrictions have been imposed even on the freedom of movement of human beings in an endeavour to arrest the progress of the disease. Three factors connected with the Continental outbreaks have great importance in relation to this country and point clearly to the source from which infection was introduced into England, namely:—

(1) the disease is of a particularly virulent character;
(2) it reached the heaviest and most widespread infection at the very moment of the autumn (September to November) mass-migration of birds, from the Continent to the eastern and southern counties of England; and
(3) in the series of outbreaks that commenced in England in the middle of October the disease has been found to be of the same type as that officially identified on the Continent. (Several types of the disease are recognized by research workers—see paragraph 10 below.)

One of the most dangerous characteristics of foot-and-mouth disease lies in the facility with which it can be conveyed long distances by mechanical means, and although it is not known whether birds are themselves naturally susceptible to infection, there is little doubt that they can carry the virus mechanically and deposit it on the pastures on first alighting in England. There is, therefore, strong circumstantial evidence pointing to the conclusion that the infection of this country in October and November was due to migratory birds acting as mechanical carriers. No organised measures against the risk of the introduction of infection by this means are, however, considered practicable.

Other theories have been advanced on the possible source of infection, including (*a*) hay and straw used as packing for imported merchandise, (*b*) imported fruit or vegetables, (*c*) the collection of virus on the tyres of motor cars brought from the Continent, (*d*) imported vaccine, or (*e*) imported animal products. No evidence has, however, been found associating any of these suggested agents with the present outbreaks. It is, moreover, a reasonable assumption that such agents, had they been responsible, would have caused a wider distribution of outbreaks throughout the country, whereas the great majority of the present series have occurred in the eastern and southern coastal counties.

9. General Measures to Prevent Introduction of Infection from Abroad.—The most dangerous means by which foot-and-mouth disease may be carried is through the agency of the live animal, but the importation of live animals from all countries infected with foot-and-mouth disease is definitely prohibited. The other channels through which the virus has been or may possibly be introduced include in addition to migrating birds:—

(*a*) Carcases or other animal products.
(*b*) Feeding stuffs.
(*c*) Hay and straw and packing materials.
(*d*) Vegetables and fruit.
(*e*) Movements of human beings.
(*f*) Motor vehicles.

(*a*) Carcases (Meat): *Prohibition from Continent of Europe.*—In 1926 the disease was definitely discovered in fresh pig carcases imported from Belgium and Holland in connection with outbreaks in Lanarkshire. As a consequence the importation of fresh carcases from the Continent of Europe was prohibited by the Importation of Carcases (Prohibition) Order of that year. The effect of this Order, which is still in operation, has been appreciably to reduce the number of initial or primary invasions of the disease. Following that Order investigations were conducted by the Foot-and-Mouth Disease Research Committee which proved that the virus could remain infective in the bone marrow of chilled or frozen beef for 76 days.

Arrangements with South American Governments.—In view of the risks proved to exist by the experiments of the Research Committee, representations were made to the Governments of Argentina, Uruguay, Brazil and Chile, all of whom in consequence made regulations prohibiting the exportation to Great Britain of carcases or parts of carcases of animals affected with foot-and-mouth disease or of animals forming part of the same troop as the diseased animals. Special arrangements were made by those Governments for the inspection of the animals before and after slaughter. When foot-and-mouth disease is found in any troop of animals in the export abattoirs the whole of the troop after slaughter is diverted to other purposes than export to Great Britain. In order to reduce the incidence of disease in the export abattoirs a system of inspection on the farms before the animals are moved to the slaughterhouse was organized. For several years after the inauguration of these arrangements a veterinary inspector of the British Ministry of Agriculture was stationed in South America to observe their operation, and in the autumn of 1936 a further visit was paid by one of the Ministry's senior veterinary inspectors to observe existing conditions and discuss the operation of the regulations with the authorities.

The present situation can be summarized as follows:—

The Argentine.—The Argentine Government has decided to increase its field staff in order to intensify inspection and to extend the farm inspection of fat animals, not only of those about to be moved to the export abattoirs, but also those about to be moved to markets, with a view to reducing the circulation of animals affected with foot-and-mouth disease. The field staff will be doubled.

Certain alterations at the large market at Buenos Aires will be made with a view to the better control of any troops of animals found diseased on arrival.

Patagonia.—This province, which exports lamb and mutton to this country, has been for some years, and continues to be free from foot-and-mouth disease. Apart from the staff of veterinary inspectors sent during the season it is proposed to establish a permanent Patagonian veterinary service, partly to deal with disease in the territory and partly to deal with animals coming into the territory with a view to the prevention of the introduction of foot-and-mouth disease.

Chile.—The importation of meat from Chile to this country is confined to exports of lamb and mutton from the province of Magallanes which adjoins the Argentine province of Patagonia. Like Patagonia, the province of Magallanes has been free from foot-and-mouth disease for a number of years, and the quarantine arrangements initiated by the Argentine Government for the protection of Patagonian territory will indirectly offer protection to the province of Magallanes.

Uruguay and Brazil.—No special comment is called for

in connection with the import trade from these two countries. It is reported that the existing regulations are administered satisfactorily.

Further Preventive Orders.—Two further Orders of importance are in force in Great Britain which are aimed at the prevention of the introduction to animals in this country of infection by imported meat, viz.:—

(i) *The Foot-and-Mouth Disease (Boiling of Animal Foodstuffs) Order* of 1932, which requires the boiling for one hour of all animal feeding stuffs, including broken and waste kitchen refuse and meat scraps, before being fed to animals.

(ii) *The Importation of Meat (Wrapping Materials) Order of* 1932, which prescribes the use of a red striped wrapper for meat imported from infected countries and prohibits the use of these wrappers subsequently as containers for feeding stuffs or bedding for animals or for fertilizers or horticultural products which might come into contact with animals on the farm. Further, it is required that all meat wrappers shall be kept apart from animals until they have been boiled or otherwise effectively sterilized.

(*b*) Feeding Stuffs.—In addition to the inquiries made in each initial case, a special inquiry was conducted in a series of outbreaks some years ago when outbreaks were more numerous, into the character and origin of the feeding stuffs used on the infected farms and the conclusion was reached that the possibility of feeding stuffs being the origin of infection in any general sense was extremely remote. Further, the process of manufacture of linseed and cottonseed cakes in this country includes the subjection of the seeds to a temperature sufficient to kill the virus of foot-and-mouth disease. Moreover, although Scotland is a large consumer of artificial feeding stuffs unexplained outbreaks of the disease occur very rarely in that country. It is considered, therefore, that the adoption of any restrictive action either as regards feeding stuffs or the bags in which they are imported could not be justified.

(*c*) Hay and Straw Packing Materials.—The importation of hay and straw for use as fodder or litter for animals from infected countries is already prohibited by the Foreign Hay and Straw Order of 1912. These materials may be used, however, as packing for imported goods. The Departmental Committee in their Report issued in 1925 [Cmd. 2350] stated that the imposition of a prohibition against the use of hay or straw as packing, or to require its destruction at the port of disembarkation, would involve an interference with our overseas trade in the many articles habitually packed in hay and straw of such a far-reaching character as could only be justified by an overwhelming case. In only three of the initial outbreaks during the past 12 years has hay and straw packing material of foreign origin been implicated, but even in those cases there was no proof that this was the cause of the outbreaks. There is, therefore, no case for prohibition. Adequate protection against this risk has, however, been provided by the Foot-and-Mouth Disease (Packing Materials) Orders of 1925 and 1926, which prohibit all such packing material, whether of home or foreign origin, from being brought into contact with animals, and require its destruction when its use as packing is finished.

(*d*) Imported Vegetables or Fruit.—Inquiries show that in only five cases over a period of many years could imported vegetables possibly have been involved in initial outbreaks of foot-and-mouth disease, and in four of these hotel refuse and swill containing scraps of foreign meat were also used, and it is equally possible that the latter might have been the origin of the disease. In the remaining case some of the vegetables were imported in sacks that might have been contaminated, but in that case also other circumstances existed pointing to alternative methods of infection. There is no evidence against imported fruit.

(*e*) Movements of Human Beings.—The introduction of infection from the Continent by human beings who may have been in direct contact with the virus shortly before leaving for this country is a possible risk, but no outbreak has been traced to such a source. The Departmental Committee of 1925 stated that "whatever the danger of infection from this source may be we do not consider that it would be practicable to attempt to prescribe any disinfection of persons arriving from the Continent. Such a measure would not be tolerated even if the facts in support of its adoption were immeasurably stronger than they are."

(*f*) Motor Vehicles.—It has also been suggested that motor cars may bring infection and should be disinfected on their arrival in or return to this country. Such a requirement would involve the provision of proper depots and adequate facilities for the rapid treatment of many cars, while anything less than a thorough washing would be valueless. Furthermore, the control and supervision of cars while en route to the cleaning depots and until the completion of the operation would be necessary. The expense and interference with the normal course of traffic which would be occasioned would be serious, and there is no information available to suggest that such a regulation would be justified by any risk involved.

10. Research.—All research in connection with foot-and-mouth disease in this country is carried out by the Foot-and-Mouth Disease Research Committee which was appointed by the Minister of Agriculture and Fisheries, in 1924, to "initiate, direct and conduct investigations into foot-and-mouth disease, either in this country or elsewhere with a view of discovering means whereby the invasions of the disease may be rendered less harmful to agriculture." The committee consists of eminent scientists of the medical and veterinary professions; Sir Joseph Arkwright is the Chairman. Much additional knowledge has been gained by the work of this committee which has issued five Progress Reports. The work of the committee continues. In the future programme of its work attention is to be given to the problem of immunisation—a problem complicated by the fact that there are several types of virus and that immunity against one type does not confer immunity against any of the others. The typing of the virus in all initial outbreaks in this country is regularly carried out. In the present series of outbreaks (Autumn, 1937) the viruses so far have all typed as "O," and information has been received that the same type of virus has been identified in the present endemic in France, Holland and Germany. The committee has also outlined a series of experiments to ascertain whether birds are susceptible to the disease or capable of mechanically transmitting the virus.

The question has been raised whether cattle in this country could be protected against foot-and-mouth disease by inoculation with a serum such as has been used in Germany. A serum obtained from that country has been used experimentally in Great Britain, but in view of the results obtained both in the field and in the laboratory, it was decided not to proceed further with the experiments. The Foot-and-Mouth Disease Research Committee reported this year that "such serum as is at present available cannot be relied upon to protect a bovine from infection when intimately exposed to a highly infective case of disease," and the recent course of events on the Continent (*see* paragraph 8 above) lends strong support to that view.

11. The Export Trade in British Pedigree Stock in Relation to Outbreaks of Foot-and-Mouth Disease.—The regulations of many of the British

dominions and colonies relating to the importation of livestock require the examination of imported animals with a view to the certification of the absence of certain diseases. The export trade in British pedigree stock, which is mutually valuable to breeders of the best class of stock in Great Britain and to stock raisers in the dominions and colonies overseas who wish to obtain the best quality foundation stock, was seriously interrupted from 1921-1928 by the embargoes which many of the importing dominions and colonies had found it necessary to impose in order to prevent the risk of the introduction of foot-and-mouth disease arising from the outbreaks of that disease in Great Britain.

In order to remove this serious handicap to the trade as far as practicable, the London Quarantine Station was established in 1928 at the East India Dock, so that British pedigree stock could be isolated under official veterinary supervision for a period immediately before shipment sufficient to cover the maximum period of incubation of foot-and-mouth disease with a sufficient margin, the object being to provide all reasonable assurance that the animals shipped are free from foot-and-mouth disease and from the risk of their conveying infection to importing countries. In choosing the site for the establishment of this station particular care was taken to select a place so isolated as to eliminate any risk of the introduction from outside sources of any infection from ordinary causes.

Rigid conditions were laid down by the Minister of Agriculture and Fisheries in an Order entitled the Quarantine Stations (Regulation) Order, 1928, and in certain rules for the control of the station in order to ensure the healthy condition of animals admitted to and shipped from the quarantine station, and to prevent infection entering the station either by persons, animals or things.

The main features of this system of quarantine are:—

(*a*) no animals are qualified for admission into the station unless they come from premises in Great Britain situate outside a radius of 15 miles from any place on which foot-and-mouth disease (or cattle plague or pleuro-pneumonia) has been certified to exist during the three preceding months, and unless the animals to be exported, and all other animals on the premises from which they are brought, have been examined immediately before movement into the quarantine station by a Veterinary Inspector appointed by the Minister of Agriculture and Fisheries and certified by him to be free from the above-mentioned diseases; and

(*b*) quarantine for not less than 14 days in the station for the purpose of covering the period of incubation of foot-and-mouth disease.

The Order also provides for the movement of the animals *direct* from the quarantine station to a vessel for shipment, and requires that the animals be accompanied by a certificate of a veterinary inspector of the Ministry of Agriculture and Fisheries to the effect that the animals were admitted to the quarantine station in accordance with the Order, were detained and isolated in the station under official veterinary supervision for the prescribed period of 14 days, and continued during the whole of that period to be free from any of the above-mentioned diseases. The Order further provides that fodder or litter supplied for the use of the animals during the quarantine period and subsequently during the voyage must be obtained under permission given by the Ministry from districts certified to have been free from foot-and-mouth disease for at least three months.

It should be emphasised that foot-and-mouth disease is dealt with in Great Britain by the slaughter policy whenever and wherever it appears, accompanied by efficient methods of disinfection and drastic restrictions on the removal of animals in infected areas, including entire prohibition of movement out of such areas. It is not endemic in Great Britain, and has not been present in an endemic form since the slaughter policy was introduced. The possibility of the existence among exported stock of what are known as "carriers" of infection, *i.e.*, animals which have passed through the stages of the disease, and which in the case of a very small percentage may in consequence become "carriers," is thus entirely eliminated.

The London Quarantine Station is under the management of the Ministry of Agriculture and Fisheries. During the period of its operation, *i.e.*, since 1928, the numbers of animals that have passed through the station *en route* to the dominions and colonies are as follows. In no instance has foot-and-mouth disease been conveyed by any of these animals.

Total Number of Animals Exported through the London Quarantine Station Annually since 1928.

Country of Destination.	1928	1929	1930	1931	1932	1933	1934	1935	1936	1937 up to 14/12	Totals.
Antigua...	—	—	2	—	2	—	—	—	—	—	4
Australia	—	253	225	91	49	103	138	119	174	210	1,362
Barbados	—	—	—	—	—	2	—	—	—	—	2
Canada	—	—	—	—	—	29	10	97	118	107	361
Cyprus	—	2	—	—	—	—	—	—	—	—	2
Gold Coast	—	—	8	—	—	—	—	—	—	—	8
Irish Free State	174	54	112	38	37	—	25	26	24	28	518
Northern Ireland	—	3	—	—	—	—	—	—	—	—	3
Nigeria	—	2	—	—	—	—	—	—	—	—	2
Palestine	—	5	3	9	—	9	1	—	—	—	27
Northern Rhodesia	—	20	—	—	—	—	—	—	—	—	20
Southern Rhodesia	31	130	53	11	4	5	6	2	7	7	256
Union of South Africa	128	152	200	230	217	147	192	319	465	408	2,458
South-West Africa	—	15	24	1	3	—	—	—	—	—	43
Trinidad	—	7	—	—	3	—	—	2	—	—	12
Totals	333	643	627	380	315	295	372	565	788	760	5,078

We append the following tables, additional to those published in the foregoing memorandum, as likely to be of interest in view of the editorial article on the subject of foot-and-mouth disease published in this issue.

STATEMENT SHOWING THE NUMBER OF OUTBREAKS IN ENGLAND AND WALES IN EACH MONTH, JANUARY TO SEPTEMBER, 1937 AND THE COUNTIES IN WHICH THEY OCCURRED.

	January.	February.	March.	April.	May.	June.	July.	August.	September
Berks	—	—	—	—	—	—	—	—	—
Bucks	—	—	—	—	—	—	—	—	—
Chester	—	—	—	—	—	—	—	2	—
Derby	1	—	—	—	—	—	—	—	—
Devon	—	—	—	—	—	1	—	—	—
Dorset	—	—	—	—	—	—	—	—	—
Essex	—	—	—	—	—	—	—	—	—
Hereford	1	1	—	—	—	—	—	—	—
Hants	—	—	—	—	—	—	—	—	—
Kent	—	—	—	—	—	—	—	—	—
Lincoln (Lindsay) ...	—	—	—	—	—	—	—	—	—
Middlesex	—	—	—	—	—	—	—	—	—
Norfolk	—	—	—	—	—	—	—	—	—
Northumberland ...	—	—	—	—	—	—	—	—	—
Peterborough	—	—	—	—	—	—	—	—	—
Somerset...	—	—	—	—	—	—	—	—	—
Southants	—	—	—	—	—	—	—	—	—
Suffolk	—	—	—	—	—	1	—	—	—
Surrey	—	—	—	—	—	—	—	—	—
Sussex (East)	—	—	—	—	—	—	—	—	—
Sussex (West)	—	—	—	—	—	—	—	—	—
Sussex (West)	—	—	—	—	—	—	—	—	—
Wilts	—	—	—	—	—	—	—	—	—
Yorks, N.R.	—	—	—	—	—	—	—	—	—
Yorks, W.R.	—	—	—	—	—	—	—	—	—
Berwick	—	—	—	—	—	1	3	—	—
Flint	—	—	—	—	—	—	6	2	—
Total (by months) 19	2	1	—	—	—	3	9	4	—

STATEMENT SHOWING THE NUMBERS OF OUTBREAKS IN ENGLAND AND WALES IN EACH WEEK, OCTOBER 16TH, 1937, TO FEBRUARY 20TH, 1938, AND THE COUNTIES IN WHICH THEY OCCURRED. WEEK ENDING.

County.	Oct. 17	Oct. 24	Oct. 31	Nov. 7	Nov. 14	Nov. 21	Nov. 28	Dec. 5	Dec. 12	Dec. 19	Dec. 26	Jan. 2	Jan. 9	Jan. 16	Jan. 23	Jan. 30	Feb. 6	Feb. 13	Feb. 20	Totals.
Berks	—	—	—	—	—	—	—	—	—	1	—	—	—	2	—	1	—	—	—	4
Bucks	—	—	—	—	—	—	1	—	—	—	—	—	—	—	—	—	—	—	—	1
Chester	—	—	—	—	—	—	—	1	—	—	—	—	—	—	—	—	—	—	—	1
Dorset	—	—	—	—	—	—	—	1	1	1	2	3	2	3	4	1	—	1	—	19
Essex	—	—	—	2	—	2	2	1	1	—	—	—	—	—	1	—	—	—	—	9
Hunts	—	—	—	—	3	3	1	1	—	—	—	—	—	—	—	—	—	—	—	8
Soke of Peterborough	—	—	—	—	—	1	—	1	—	—	—	—	—	—	—	—	—	—	—	2
Kent	—	—	—	5	4	4	1	—	1	2	2	1	1	1	—	—	—	—	1	23
Lincoln (Lindsey)	—	—	—	1	1	1	1	—	—	—	—	—	—	—	—	—	—	—	—	4
Middlesex ...	—	—	—	—	—	—	—	—	—	—	1	—	—	—	—	—	—	—	—	1
Norfolk	2	—	9	5	2	1	—	—	—	—	—	1	—	—	—	—	—	—	—	20
Northumberland	—	—	—	—	—	—	—	1	1	—	—	—	—	—	—	—	—	—	—	2
Somerset... ...	—	—	—	—	—	—	—	—	—	—	—	—	1	2	3	5	5	4	3	23
Southants ...	—	—	—	—	—	—	—	—	—	—	1	—	—	1	1	—	2	1	1	7
Suffolk	—	—	1	4	8	3	—	—	—	—	1	—	1	—	—	—	—	—	—	18
Surrey	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1
Sussex, East ...	—	—	1	—	1	1	4	1	7	2	—	2	—	—	—	—	—	—	—	19
Sussex, West ...	—	—	—	—	—	—	1	1	—	—	—	—	—	—	—	—	—	—	—	2
Wilts	—	—	—	—	—	—	—	1	3	10	23	17	7	8	8	10	4	3	—	94
Yorks, W.R. ...	—	—	—	—	—	—	—	—	—	—	—	—	1	—	—	2	—	—	—	3
Total ...	3	—	11	17	19	16	11	9	14	16	30	24	13	17	17	19	11	9	5	261

(*Continued at foot of page 262.*)

FOOT-AND-MOUTH DISEASE

EXTENSION OF SCOPE OF RESEARCH

On Wednesday last the announcement was made that the Minister of Agriculture, having recently had under consideration the question of the future of research work into foot-and-mouth disease, which is being conducted under the control of the Foot-and-Mouth Disease Research Committee, has decided to enlarge the committee to include representatives of the Agricultural Research Council and Medical Research Council, and has appointed seven additional members, three of whom, we are glad to note—Professor Dalling, Major Dunkin and Professor Minett—are members of the veterinary profession.

"The problem under investigation is a complex one," states the announcement, "and its scope has become wider than was envisaged when the work was first started 14 years ago. There is increasing evidence of the necessity for pursuing the intensive study of this particular member of a group of diseases affecting human beings, animals and plants, in close relationship with investigations into virus diseases generally, and of enlisting the experience of workers in other fields of virus research in the elucidation of the problems connected with foot-and-mouth disease.

"In the circumstances the Minister, after consultation with the Development Commissioners, has come to the conclusion that it would be an advantage if the Agricultural Research Council and the Medical Research Council were more actively and directly associated with the work of the committee than at present, and has decided to broaden the basis of the committee by appointing the following additional members, in consultation with the two Councils:—

Professor S. B. Bedson (the London Hospital), Professor T. Dalling (Director of the Institute of Animal Pathology, Cambridge), Major G. W. Dunkin (Director, Agricultural Research Council Field Station), Mr. G. M. Findlay (Wellcome Bureau of Scientific Research), Professor H. B. Maitland (University of Manchester), Professor F. C. Minett (Director, Research Institute in Animal Pathology, Royal Veterinary College), and Mr. J. Henderson Smith (Rothamsted Experimental Station)."

The existing members of the committee are: Sir Joseph Arkwright (Lister Institute of Preventive Medicine), Chairman, Dr. W. Horner Andrews (Director, Veterinary Laboratory, Ministry of Agriculture), Professor W. Bulloch (Professor of Bacteriology, University of London), Professor J. Basil Buxton (Principal, Royal Veterinary College), Dr. J. Russell Greig (Director, Moredun Institute, Gilmerton, Midlothian), Sir John Kelland (Chief Veterinary Officer, Ministry of Agriculture), Sir Patrick Laidlaw (Director, Department of Experimental Pathology, National Institute for Medical Research), Dr. Charles Todd (National Institute for Medical Research), and Mr. V. E. Wilkins (Ministry of Agriculture).

Number of Outbreaks of Foot-and-Mouth Disease in European Countries.

Year.	Belgium.	Netherlands.	France.	Germany.	Switzerland.	Italy.	Czecho Slovakia.	Poland	Yugo Slavia.	Great Britain.
1936	18	40	524	371	nil	5,212	nil	nil	nil	67
1937										
January	—	1	13	5	—	56	—	—	—	2
February	—	3	3	5	—	35	—	—	—	1
March	—	5	—	3	—	46	—	—	—	—
April	—	26	3	9	—	18	—	—	—	—
May	—	9	30	6	—	17	—	—	—	—
June	—	—	789	2	—	10	—	—	—	3
July	10	2	2,727	7	—	12	—	—	—	9
August	319	394	9,327	7	—	25	—	—	—	4
September	4,090	11,444	21,970	267	6	13	—	—	—	1
October	14,098	37,998	32,808	3,295	13	28	—	—	—	16
November	22,331	31,230	47,657	11,739	101	13	—	—	9	63
December	22,419	—	45,085	21,604	153	—	1	1	24	69
1938										
January	4,077 (1st–15th)	—	—	18,575	148 (1st–30th)	—	15 (1st–15th)	4 (1st–15th)	28 (1st–15th)	75

It is reported that there were no outbreaks in 1936 and 1937 in the following countries: Austria, Bulgaria, Estonia, Finland, Latvia, Lithuania, Norway, Roumania and Sweden.

STATE VETERINARY SERVICE

FURTHER APPOINTMENTS

Divisional Inspectors

The Ministry of Agriculture and Fisheries announces further appointments in the augmented State Veterinary Service which is being set up under Part IV of the Agriculture Act, 1937.

As previously intimated in our columns, for the purposes of the field organisation of the service, Great Britain will be divided into 78 Divisions, each in charge of a Divisional Inspector; these 78 Divisions will be grouped into 22 Areas, each in charge of a Superintending Inspector. The appointments of the Superintending Inspectors have already been announced, and the Minister has now selected the officers to fill the posts of Divisional Inspector. The names of the officers selected, their present appointments (whether with the Ministry or with a local authority), and the Divisions and official Stations allotted to them are as follows:—

(*a*) ENGLAND

Division No.	Counties.	Divisional Inspector (present appointment in brackets).	Station.
1	Northumberland	Mr. G. F. Pickering, M.R.C.V.S., D.V.S.M. (Northumberland)	Newcastle-on-Tyne
2	Cumberland	Mr. J. Cameron, B.SC., M.R.C.V.S., D.V.S.M. (Cumberland)	Carlisle
3	Westmorland	Capt. T. W. Woodhead, M.C., M.R.C.V.S. (Ministry)	Kendal
4	Durham	Mr. E. R. Callender, M.R.C.V.S. (Durham (Co.))	Durham
5	Yorks, N.R.	Mr. E. F. Hardwick, M.R.C.V.S. (North Riding)	Northallerton
6	Yorks, E.R.	Mr. E. Varley, M.R.C.V.S. (Ministry)	Beverley
7	Yorks, W.R.	Mr. W. T. MacGregor, M.R.C.V.S. (West Riding)	Wakefield
8	Lancaster	Mr. J. W. Wilson, M.R.C.V.S. (Ministry)	Preston
9	Cheshire	Mr. A. L. F. Mullen, M.R.C.V.S., D.V.S.M. (Chester (Co.))	Chester
10	Derby	Mr. H. Burrow, M.R.C.V.S., D.V.S.M. (Derby (Co.))	Derby
11	Nottingham	Mr. H. C. Gregory, M.R.C.V.S., D.V.S.M. (Ministry)	Nottingham
12	Lincs (Lindsey)	Mr. C. P. Inglis, M.R.C.V.S. (Ministry)	Lincoln
13	Lincs (Kesteven)	Mr. G. A. Moore, M.R.C.V.S. (Salop)	Sleaford
14	Lincs (Holland)	Capt. R. E. Murison, M.R.C.V.S. (Ministry)	Boston
15	Norfolk	Mr. B. A. Claxton, M.R.C.V.S. (Ministry)	Norwich
16	Suffolk (East)	Mr. S. Sharp, M.R.C.V.S., D.V.S.M. (Somerset)	Ipswich
17	Suffolk (West)	Mr. R. R. Willing, M.R.C.V.S. (Ministry)	Bury St. Edmunds
18	Isle of Ely	Mr. A. V. Franklin, M.R.C.V.S. (Ministry)	March
19	Cambridge	Mr. R. W. A. Watchorn, M.R.C.V.S., D.V.S.M. (Ministry)	Cambridge
20	Rutland; Peterborough; Huntingdon	Major W. Barr, M.R.C.V.S., D.V.H. (Ministry)	Huntingdon
21	Leicester	Capt. E. J. Burndred, M.C., M.R.C.V.S., D.V.H. (Blackburn)	Leicester
22	Northampton	Mr. D. D. Canning, M.R.C.V.S., D.V.S.M. (West Riding)	Northampton
23	Warwick	Mr. S. V. Collard, M.R.C.V.S. (Ministry)	Warwick
24	Stafford	Mr. F. A. Davidson, B.SC., M.R.C.V.S. (Stafford (Co.))	Stafford
25	Shropshire	Mr. G. McKee, M.R.C.V.S., D.V.S.M. (Salop)	Shrewsbury
26	Hereford	Dr. A. J. Wilsdon, PH.D., B.SC., M.R.C.V.S. (Hereford (Co.))	Hereford
27	Worcester	Mr. W. Scott, F.R.C.V.S., D.V.S.M. (Worcester (Co.))	Worcester
28	Gloucester	Mr. J. T. Taylor, M.R.C.V.S. (Gloucester (Co.))	Gloucester
29	Oxford	Mr. G. S. Reid Chalmers, M.R.C.V.S. (Oxford (Co.))	Oxford
30	Buckingham	Capt. H. B. Collet, B.V.SC., M.R.C.V.S. (Bucks)	Aylesbury
31	Bedford	Mr. D. Johnston, M.R.C.V.S., D.V.S.M. (Bedford (Co.))	Bedford
32	Hertford; Middlesex; London	Major E. S. James, O.B.E., B.V.SC., M.R.C.V.S., D.V.S.M. (Ministry)	Hertford
33	Essex	Capt. F. W. Medlock, M.R.C.V.S. (Essex)	Chelmsford
34	Kent	Mr. A. J. Beeson, M.R.C.V.S. (Ministry)	Maidstone
35	Surrey	Mr. E. Clark, M.R.C.V.S., D.V.S.M. (Surrey)	Kingston-on-Thames
36	Sussex (East)	Mr. E. P. Thorne, M.R.C.V.S. (Ministry)	Lewes
37	Sussex (West)	Dr. L. Jordan, PH.D., M.R.C.V.S. (West Sussex)	Chichester
38	Berkshire	Mr. R. M. Davidson, B.SC., M.R.C.V.S. (Berkshire)	Reading
39	Southampton	Mr. L. J. Ford, M.R.C.V.S. (Ministry)	Winchester
40	Isle of Wight	Capt. G. W. Begg, M.R.C.V.S., D.V.S.M. (Hampshire)	Newport
41	Wiltshire	Mr. S. V. Golledge, M.R.C.V.S. (Wiltshire)	Trowbridge
42	Somerset	Capt. W. Tweed, M.R.C.V.S., D.V.S.M. (Somerset)	Taunton
43	Dorset	Mr. A. Alexander, M.R.C.V.S., D.V.S.M. (Dorset)	Dorchester
44	Devon	Mr. D. S. Barbour, M.R.C.V.S. (Devon)	Exeter
45	Cornwall	Mr. L. E. Perkins, M.R.C.V.S. (Cornwall)	Truro

(*b*) WALES

Division No.	Counties.	Divisional Inspector (present appointment in brackets).	Station.
46	Anglesey	Capt. W. J. Leyshon, M.R.C.V.S. (London)	Llangefni
47	Caernarvon	Mr. J. Richards, M.R.C.V.S. (Ministry)	Carnarvon
48	Denbigh	Mr. H. M. Salusbury, M.R.C.V.S., D.V.H. (Sheffield)	Ruthin
49	Flint	Mr. K. A. Forker, M.R.C.V.S. (Ministry)	Mold
50	Merioneth	Mr. A. G. Beynon, M.R.C.V.S., D.V.S.M. (Ministry)	Barmouth
51	Montgomery	Capt. L.Ll. Jones, M.R.C.V.S. (Montgomery)	Welshpool
52	Radnor	Mr. A. Houston, M.R.C.V.S. (Ministry)	Llandrindod Wells
53	Cardigan	Mr. A. F. Butler, M.R.C.V.S. (Ministry)	Aberystwyth
54	Brecknock	Mr. J. Reid, M.R.C.V.S., D.V.S.M. (Cumberland)	Brecon
55	Monmouth	Capt. F. J. Mullane, M.R.C.V.S. (Ministry)	Newport
56	Glamorgan	Mr. A. E. Ferguson, M.R.C.V.S. (Ministry)	Bridgend
57	Carmarthen	Mr. G. T. Cattell, M.R.C.V.S. (Ministry)	Carmarthen
58	Pembroke	Mr. H. M. M. Duff, M.R.C.V.S., D.V.S.M. (Ministry)	Haverfordwest

(*c*) SCOTLAND

59	Caithness ; Sutherland	Mr. J. MacKintosh, M.C., M.R.C.V.S. (Ministry)	Wick
60	Ross and Cromarty	Mr. A. C. Urquhart, M.R.C.V.S. (Ministry)	Dingwall
61	Inverness	Mr. J. Smith, B.Sc., M.R.C.V.S. (Durham (Co.))	Inverness
62	Shetland	Mr. J. Plenderleith, M.R.C.V.S., D.V.S.M. (Ministry)	Lerwick
63	Orkney	Mr. A. P. Steele, B.Sc., M.R.C.V.S., D.V.S.M. (Dept. of Agriculture for Scotland)	Kirkwall
64	Banff ; Moray ; Nairn	Mr. R. J. P. Watson, M.R.C.V.S. (Ministry)	Elgin
65	Aberdeen	Capt. G. Howie, F.R.C.V.S. (Aberdeen (Co.))	Aberdeen
66	Angus ; Kincardine	Mr. T. Johnston, M.R.C.V.S., D.V.S.M. (Durham (Co.))	Forfar
67	Clackmannan ; Fife	Mr. G. D. Munro, M.R.C.V.S. (Ministry)	Cupar
68	Perth ; Kinross	Mr. D. Cameron, B.Sc., M.R.C.V.S., D.V.S.M. (Ministry)	Perth
69	Argyll	Mr. G. G. Rennie, M.R.C.V.S. (Ministry)	Lochgilphead
70	Stirling ; Dumbarton	Capt. W. Watt, M.R.C.V.S., D.V.S.M. (Ministry)	Stirling
71	Renfrew ; Bute	Mr. A. M. K. McLeod, M.R.C.V.S., D.V.S.M. (Renfrew)	Paisley
72	Ayr	Capt. Q. A. Stewart, M.R.C.V.S. (Ayr (Co.))	Ayr
73	Wigtown	Mr. J. Stewart, M.R.C.V.S. (Ministry)	Stranraer
74	Kirkcudbright	Capt. J. Waddell, M.R.C.V.S. (Kirkcudbright)	Kirkcudbright
75	Lanark	Mr. J. Weir, M.R.C.V.S., D.V.S.M. (Lanark)	Hamilton
76	Dumfries	Mr. G. A. Sangster, M.R.C.V.S. (Dumfries (Co.))	Dumfries
77	East Lothian; Mid-Lothian; West Lothian ; Peebles	Mr. W. D. Macrae, M.R.C.V.S., D.V.S.M. (Midlothian)	Edinburgh
78	Selkirk ; Roxburgh ; Berwick	Mr. E. G. Duncan, M.R.C.V.S. (West Riding)	Galashiels

In addition to the officers whose names are given above, the following Divisional Inspectors will be engaged upon the duties mentioned :—

(*a*) *Headquarter duties at the Ministry* :—Messrs. P. D. Baylis, M.R.C.V.S., E. R. Corrigall, M.R.C.V.S., D.V.S.M., J. C. Davidson, M.R.C.V.S., E. G. Morris, M.R.C.V.S., C. S. Randle, M.R.C.V.S., J. Reid, M.R.C.V.S., J. Small, M.R.C.V.S., and J. C. Wallace, M.R.C.V.S. (of the Ministry) ; and Captain W. Halstead, M.R.C.V.S., D.V.S.M. (Bradford), and Mr. W. A. Milligan. M.R.C.V.S., D.V.S.M. (Dorset).

(*b*) *Headquarter duties at Edinburgh in connection with the Tuberculosis* (*Attested Herds*) *Scheme* (*Scotland*) :—Captain T. Bannatyne, M.R.C.V.S., D.V.S.M. (of the Ministry).

(*c*) *Port duties* (*Importation of Animals*) :—Mr. A. A. Hamilton, M.R.C.V.S., Mr. R. E. Lloyd, M.R.C.V.S., Captain W. S. Petrie, M.R.C.V.S., Major H. K. Purdy, M.C., M.R.C.V.S., Captain F. T. Smyth, M.R.C.V.S., and Captain C. Tracy, M.R.C.V.S., D.V.H. (of the Ministry).

(*d*) *Pirbright Experimental Station* :—Mr. A. M. Graham, M.R.C.V.S. (of the Ministry) ; and

(*e*) *London Quarantine Station* :—Captain P. W. Walker, M.R.C.V.S. (of the Ministry).

The Minister proposes to bring Part IV of the Agriculture Act, 1937, into operation on April 1st next. The Superintending Inspectors took up duty in their respective areas on February 14th and arrangements are being made for the Divisional Inspectors to be in position on February 28th in order to prepare the way, in consultation with the local authorities concerned, for the transfer of veterinary functions on the "Appointed Day."

In Parliament

The following questions and answers have been recorded in the House of Commons recently:—

Attested Herds

Mr. R. Gibson asked the Secretary of State for Scotland why the county of Ayr has as many as 338 attested tubercle-free herds out of a total of 1,618 registered herds, while the county of Renfrew has only 30 out of a total of 444, and the county of Midlothian only ten out of a total of 271, respectively, the percentages being 21, 6·7 and 3·7; what are the numbers of cows in the said attested and registered herds, respectively; and what proposals he has with a view to increasing the number of tubercle-free herds in the counties of Renfrew and Midlothian, respectively?

Mr. Elliot: The high percentage of dairy herds attested as free from tuberculosis in the county of Ayr as compared with the counties of Renfrew and Midlothian is due to the greater response which has been made by herd-owners in that county to the inducements offered by the attested herds scheme as well as to the fact that dairying is generally more specialised and is of particular importance in Ayrshire. With regard to the second part of the question, as the reply contains a number of figures I will circulate it in the Official Report. With regard to the last part of the question, I would draw the hon. Member's attention to Part IV of the Agriculture Act, 1937, which confers extended powers upon my right hon. Friend the Minister of Agriculture and Fisheries to initiate schemes for the eradication of bovine tuberculosis in Great Britain. These powers will come into operation at an early date.

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Foot-and-Mouth Disease

Major Despencer-Robertson asked the Minister of Agriculture whether he will consult actuarial experts with a view to the possibility of formulating a scheme for the State insurance of farmers against foot-and-mouth disease and against the whole loss incurred by them, in the public interest, when their animals are slaughtered, including loss of profits, whereby their business is destroyed?

The Minister of Agriculture (Mr. W. S. Morrison): The question of the State insurance of stock-owners against losses which may be incurred through the compulsory slaughter of stock for the purpose of eradicating foot-and-mouth disease was considered by the Departmental Committee on Foot-and-Mouth Disease in 1924. In their report (Cmd. 2350) the committee expressed the opinion that a compulsory insurance scheme would be both costly and administratively difficult owing to the constantly varying number of stock in the hands of stock-owners and the abnormal risks involved. The committee also drew attention to serious objections, from the point of view of public policy, to such a scheme. I see no reason to dissent from the views on this subject expressed by the Departmental Committee.

Mr. de Rothschild: Is the right hon. Gentleman aware that in the matter of compensation, dairy farmers are treated worse than ordinary stock-holders?

Mr. Morrison: No, Sir; I am not aware of that. The fact is that the terms of compensation are laid down in the statute, and are beyond my control.

Mr. Hall-Caine asked the Minister of Agriculture whether he has considered the desirability of stipulating that all men engaged in the slaughtering of animals affected by foot-and-mouth disease should be confined to the farms concerned in tents or caravans until their work is finished, with the object of avoiding the risk of their carrying the infection with which they have been in contact?

Mr. W. S. Morrison: It is not considered practicable to require the farmer compulsorily to provide accommodation on the farms where outbreaks of foot-and-mouth disease occur for the men engaged in slaughtering the animals. The men are required to wear suitable overall clothing and this and their boots and hands are thoroughly disinfected immediately before the men leave the premises, the overalls being left on the farm. These precautions have been found adequate to prevent the conveyance of infection to other farms.

. . . . .

Milk Nutrition Committee (Report)

Captain Arthur Evans asked the Minister of Agriculture when the report of the Milk Nutrition Committee will be published, including the result of the investigation conducted by the National Institute of Dairy Research on the feeding of calves on raw and pasteurized milk?

Mr. W. S. Morrison: The Milk Nutrition Committee have already published one report dealing with experiments on rats at the National Institute for Research in Dairying, Reading, and at the Rowett Institute, Aberdeen. I understand that two further reports, dealing respectively with the work at these two institutions on the feeding of calves on raw and pasteurized milk and with an investigation into the effect of dietary supplements of raw and pasteurized milk on the growth and health of school children, are in preparation and should be published shortly. The committee then propose to issue a final report dealing with their inquiries as a whole.

Colonel Nathan: Will the right hon. Gentleman do his utmost to secure that these reports are published before he introduces Governmental legislation relating to milk?

Mr. Morrison: I cannot give a promise, because the committee must be the best judge of how soon it can perform its important task, but I will bear the hon. and gallant Gentleman's question in mind.

. . . . .

Poultry Industry

Mr. T. Smith asked the Minister of Agriculture whether he is now in a position to state the views of the Government on the marketing proposals recently submitted to him by the National Farmers' Union and the National Poultry Council?

Mr. Mathers asked the Minister of Agriculture whether he is now in a position to make a statement of the Government's policy regarding the poultry industry?

Mr. W. S. Morrison: As the hon. Members will be aware, the proposals of the Poultry Technical Committee, which have now been published, provide for the setting up of a Stock Improvement Commission with functions of control in regard, among other things, to the distribution of breeding stock, hatching eggs, and day-old chicks, and to a grading scheme for breeding farms. The marketing proposals to which the hon. Member refers, provide, for their part, for the setting up of a producers' marketing board to regulate certain distributive functions, with special reference to the standardisation of grading and packing of commercial egg supplies. In inviting the bodies representative of the industry to

acquaint me with their views on the report of the Technical Committee, I am asking them to reconsider their marketing proposals, in order to see whether the results which they and the committee desire could not be achieved with economy and efficiency through a single organisation. I am also inviting the bodies representing distributors to consider this question from their point of view.

Mr. Mathers: Before coming to a final decision, is the right hon. Gentleman keeping in mind the statement that he made to me some time ago, that the position of the mixed farmer with other interests is a much better one than that of the small, exclusively poultry farmer?

Mr. Morrison: I am trying to keep in mind all relevant considerations.

Mr. T. Williams: Will the right hon. Gentleman make sure, before he finally approves any marketing scheme, that it is a marketing scheme and not a price-fixing scheme?

Mr. Morrison: As I have said, it is obvious that the publication of this important report modifies the situation with regard to a marketing scheme, and I think I have taken the right course in asking those who are submitting the scheme to me to reconsider the matter afresh in view of the importance of the subject.

. . . . .

Racecourse Betting Control Board

Sir T. Moore asked the Home Secretary what amounts have been allocated by the Racecourse Betting Control Board for purposes designed to support horse racing, for the encouragement of horse breeding, and for charity, respectively, since the board commenced operations; and whether he will supply these figures for each year since 1929?

Sir S. Hoare: The reply is most conveniently given in the form of a tabular statement as follows:—

Racecourse Betting Control Board.

Grants from the Totalisator Fund approved by the Home Secretary under Section 3 (6) of the Racecourse Betting Act, 1928, and Section 18 (5) of the Betting and Lotteries Act, 1934, and grants made by the Board to charities.

From Surplus arising from operations for year.	For purposes conducive to improvements of the Sport of Horse Racing.	For purposes conducive to improvements of the Breeds of Horses.	For purposes conducive to the advancement and encouragement of Veterinary Science and Education.	Charities.	Total.
	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
1929	1,001 4 2	—	—	—	1,001 4 2
1930	2,497 15 4	—	—	—	2,497 15 4
1931	2,925 1 9	—	—	—	2,925 1 9
1932	3,086 15 1	—	—	—	3,086 15 1
1933	7,841 2 8	2,000 0 0	—	—	9,841 2 8
1934	22,872 8 7	5,000 0 0	—	—	27,872 8 7
1935	72,438 2 8	5,300 0 0	1,100 0 0	855 0 0	79,693 2 8
1936	107,964 10 0	7,350 0 0	3,500 0 0	1,540 10 0	120,355 0 0
Total ...	220,627 0 3	19,650 0 0	4,600 0 0	2,395 10 0	247,272 10 3

The Board have under consideration the allocation of a further sum of £151,500 from the surplus arising from the Board's operations in 1937, details of which will be published in the Board's Ninth Annual Report and Accounts.

EXPERIMENTAL ANAEMIAS

"In the last few years the idea that endogenous toxic factors might be responsible for anaemia has been somewhat discredited—except as regards sepsis. Recent experimental work, however, suggests," states the *Lancet*, "that such factors in association with dietary deficiencies may be of considerable importance. Rhoads* finds that if he gives small doses of indol to dogs on a deficient diet, known as the black-tongue-producing diet, the dogs develop a severe anaemia. Red cell counts may fall below 1,000,000 per c.mm. and deaths from acute anaemia are not unknown. If the animal survives the immediate drop in blood levels there is a tendency to an improved blood picture even though indol is still given. The same amount of indol fed to a dog on a normal diet causes no anaemia, and the addition of liver extract to the black-tongue-producing diet inhibits the development of an anaemia or cures one that has already developed. Studies of the bone-marrow show an extension of active marrow during the anaemic stage; this hyperplasia affects chiefly the immature cell types. Similar results have now been obtained by Rhoads and Miller† using amidopyrine instead of indol. Since amidopyrine is known to cause agranulocytosis in certain human beings it is of particular interest to note that under the experimental conditions specified the white cell count was unaffected. The anaemia due to amidopyrine was prevented by the addition of autolysed yeast to the deficient diet; liver extract was not apparently tried as a therapeutic agent in this experiment. The marrow at autopsy showed a scarcity of mature forms suggesting a condition of maturation arrest. These observations raise many interesting problems. It is known for instance that the quantity of phenols present in the intestine is increased above normal in nephritis and pernicious anaemia. Is there a toxic element in these anaemias? Does the occurrence of some such toxic substance in the body, associated with a dietary deficiency, explain individual idiosyncrasy to certain drugs? Agranulocytosis may for instance suddenly develop in someone who has apparently taken amidopyrine for years without any ill effects. We have learnt to think in terms of 'conditioned deficiencies': it seems we must now consider the possibility of 'conditioned toxicities'."

*Rhoads, C. P., *Proc. Soc. exp. Biol., N.Y.* 1937, **36**, 652.
†Rhoads, C. P., and Miller, D. K., *Ibid*, p. 654.

The Veterinary Record

February 26th, 1938

Foot-and-Mouth Disease

IT is too early to review exhaustively all the facts associated with the present grave epizootic of foot-and-mouth disease in Europe, but it is nevertheless instructive to glance at these facts now and see whether they tend to support or to refute the policy of immediate slaughter as carried out in this country.

In 1936 and the beginning of 1937 the incidence of this disease in Europe west of Russia was at a remarkably low level and it is arguable that then would have been an excellent opportunity for the European nations to have acted in concert and introduced the slaughter policy. In 1936 many countries were free of the disease and the number of outbreaks in other countries was comparatively few, *viz.*, Denmark 5, Belgium 18, Netherlands 40, Great Britain 67, Germany 371, France 524 and Italy 5,212. This low incidence, apart from Italy, continued until May, 1937, when an epizootic began in France. It is now known that this outbreak occurred as the result of the introduction into France of infected animals from North Africa, which animals were unfortunately dispersed somewhat widely throughout the country. The number of outbreaks rapidly increased from 30 in May to 47,657 in November. In July the disease began to appear in Belgium, ten outbreaks being recorded in that month, and this increased to over 22,000 for November. In the Netherlands no outbreaks were reported in June, but in August the number reported was 394 and in October 37,998. In September the disease spread both to Germany and to Switzerland, where the number of outbreaks recorded was respectively 264 and 6. By December the number in Germany was over 21,000 and had reached 153 in Switzerland, where its spread had been checked to some extent by the slaughter policy. The first outbreak in the present epizootic occurred in England early in October, 1937, and since then the monthly total has risen from 14 in October to 75 in January. The total number of outbreaks recorded for the first four months of their particular epizootics in the different countries affected was: France (May-August) 12,873, Belgium (July-October) 18,517, the Netherlands (August-November) 81,066, Germany (September-December) 36,902, Switzerland (September-December) 273, Denmark (September-December) 11, and Great Britain (October-January) 236. These figures show a striking difference between the countries, namely Denmark, Switzerland and Great Britain, which practise immediate slaughter, and those that try other methods of checking the spread of the disease. There is some circumstantial evidence in the commencement and spread of this epizootic in Great Britain in relation to that on the Continent, supporting the bird migration theory of the introduction of foot-and-mouth disease into this country. It must be emphasised, however, that at present this theory lacks rigid experimental proof.

An examination has been made of samples of virus obtained from fifty apparently initial outbreaks in Great Britain and they have all proved to be of the Vallée O type of virus, similar to the type reported to be associated with the epizootic on the Continent. The distribution of the initial outbreaks in the present series in this country is confined to those parts receiving migrating birds from Germany and the low countries, and it was not until the Continental epidemic reached those countries in mid-October, that disease appeared here.

The basis for the slaughter policy is one of economy. The disease in many cases responds to treatment, but unfortunately there is no sure method of keeping the disease to the one farm during treatment and hence the Government, in the interests of the country as a whole, steps swiftly in and annihilates the source of infection. It can be looked upon as an effective form of insurance, since the losses from the uncontrolled spread of the disease, especially in a country such as ours, would be enormous. Leclainche,* recently referring to the 1920 epizootic, states that the direct losses in Prussia alone due to death, low lactation yields, bad nutrition and serious lesions, were officially reckoned at 400,000,000 gold marks and the total losses are estimated at 600,000,000 gold marks (*i.e.* approximately £30,000,000). The virulence of the present infection is marked, especially for young stock. The mortality is exceedingly high in lambs and suckling calves and there is little doubt that havoc would be caused in the young stock of this country if the disease became rampant. Usually the death occurs from heart involvement in uncomplicated cases, but in adults the complications are many

*Leclainche, M. E. *Comptes Rendus de l'Académie d'Agriculture de France.* 1937. 23. 1004.

(*Concluded at foot of col.* 1, *page* 268.)

CLINICAL COMMUNICATIONS

Suspected "Mad Itch" in Cattle*

F. T. HARVEY, F.R.C.V.S.,
St. Columb
and
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On January 2nd, 1937, two cases of what appeared to be "mad itch" were seen by one of us (F.T.H.) in yearling cattle on a small arable farm on the coast of North Cornwall.

History and Symptoms.—A batch of five animals in fair condition had been running in a field by day, and housed at night with an allowance of corn, hay and roots. A fortnight earlier their night quarters had been changed to a stall recently occupied by a number of fattening pigs; the manure from the latter houses had been removed before the yearlings were put in. There had been no disease of any kind recently noted amongst the stock, birds, or vermin: rats being rarely seen. On the morning of January 2nd, one yearling was seen to be continually rubbing against the walls, posts, etc., the tail parts being already hairless, swollen and exuding a bloody serum, while the general condition was bad. The four in-contacts, appearing normal, were turned into the field as usual. The sick animal gradually weakened during the day, was unable to rise at 6 p.m. and died shortly after. A second case was found in the field at 4 p.m. This yearling was then rushing about and violently rubbing its rump, etc., against stone fences, parts being hairless and bleeding. The animal was seen at 8 p.m., when its condition was distressing to witness. Parts already hairless swollen, and exuding bloody serum, were violently rubbed against rough concrete walls or granite posts, and blood was also coming from the anus. The animal was up and down as in colic, licking, sweating, and gnashing the teeth, with frequent pulse and respirations. The temperature was 104°. Sedative lotions—carbolic acid 1 per cent. and chloral hydrate—afforded some relief.

January 3rd (Sunday) 11 *a.m.*—Yearling unable to stand and in an exhausted condition. Destroyed. No further cases occurred.

One head and two tails, with some bruised tissue at the bases, were forwarded to the Veterinary Laboratory of the Ministry of Agriculture and Fisheries for examination.

Laboratory Investigation at Weybridge

On January 5th, 1937, one head and portions of the tails of two cattle were received from Cornwall, together with a letter describing the symptoms shown by the affected animals and informing us that the existence of "mad itch" was suspected.

The appearance of the upper part of the tails, which were denuded of hair, swollen, with numerous skin abrasions from which haemorrhagic lymph exuded, was in itself definite evidence that there had been a condition involving intense pruritus and that these parts had been subjected to severe rubbing or actual gnawing by the animals.

On opening the cranium marked hyperaemia of the meninges and haemorrhagic extravasations into the inter-meningeal space and ventricles were observed.

Sections were prepared from various parts of the brain and from the medulla, and after appropriate staining microscopical examination revealed no abnormal features other than the congestion of the blood vessels.

Attempts were made to reproduce the disease experimentally. Portions of the brain and medulla were removed, put in 50 per cent. glycerine saline, and kept on ice for 48 hours.

On January 7th, large and small animals and poultry were inoculated, as indicated in the table on opposite page.

The test animals and poultry were kept under observation for 28 days, during which period no symptoms of the disease in question were shown. All remained perfectly healthy until discharged from the experiment (in groups) at intervals from four to six weeks after inoculation.

Discussion

There is a doubt as to whether any cases of so-called "mad itch" have occurred in this country.

In the scientific literature and in text books,

*An annotation on this subject shortly will appear in this journal.—*Editor.*

and the losses from them are serious. In view of the grave reports coming from the continent it is perhaps not surprising that whereas in 1923 and 1924 the farmers were very strong in their adverse criticism of the slaughter policy, they have offered general support for it during this epizootic.

It seems to us that the facts at present available strengthen the view of the Ministry, and we feel certain that although the profession would prefer a scientific and safe method of immunisation, it fully endorses a sound and efficient slaughter policy in the present state of our knowledge.

Source of Material.	Inoculum.	Animal.	Method of Administration.
Medulla ...	0·5 c.c. unfiltered suspension	1 rabbit 1 rabbit 2 guinea-pigs	Subcutaneous Subdural Intramuscular (cheek)
Cerebrum ...	0·5 c.c. unfiltered suspension	1 rabbit 1 rabbit 2 guinea-pigs	Subcutaneous Subdural Intramuscular (cheek)
Cerebellum ...	0·5 c.c. unfiltered suspension	1 rabbit 1 rabbit 2 guinea-pigs	Subcutaneous Subdural Intramuscular (cheek)
Hippocampus ...	0·5 c.c. unfiltered suspension	1 rabbit 1 rabbit 2 guinea-pigs	Subcutaneous Subdural Intramuscular (cheek)
*Brain suspension	0·5 c.c. unfiltered suspension	3 mice 1 fowl 1 turkey	Subcutaneous Subcutaneous Subcutaneous
*Brain suspension	5 c.c. of 10 per cent. filtrate†	1 calf 1 calf 1 sheep 1 sheep 1 pig 1 pig (X) 1 pig 1 pig (Y) 1 pig	Intramuscular (cheek) Intramuscular (tail) Intramuscular (cheek) Intramuscular (tail) Intramuscular (ear) Intramuscular (thigh) Contact to (X) Intranasal Contact to (Y)

* The brain suspension included material from Medulla, Cerebrum, Cerebellum and Hippocampus.
† Filter used was a Chamberland F.

e.g., Udall's Practice of Veterinary Medicine[2] the disease now recognised as "Aujeszky's disease," "pseudorabies," "infectious bulbar paralysis" or "mad itch" is sometimes referred to as having been first described by Aujeszky in Hungary in 1902. It is therefore perhaps of some interest to mention that we have come across a reference to what appears to be the same disease in the *J. Comp. Path.* (1889[1]) and it is possible that even earlier descriptions of the disease may exist. Strebel described [apparently in the *Schweiz. Arch. Tierhlk.*—no detailed reference is given in the *J. Comp. Path.* (1889[1])] an outbreak of disease involving four cows in the Canton of Freiburg in Switzerland. The clinical features were given as follows:—

"The animals exhibited an extraordinary itchiness, especially of the hind quarters. The itch became more and more intense, until the animal had not a moment's rest. They rubbed, licked and gnawed themselves, especially at the lower part of the hind limbs. They tried also to rub the vulva against hard objects. They stood up and lay down alternately, wounded themselves on the hind limbs, sweated profusely, and if not slaughtered they died from exhaustion and paralysis within two days." To Strebel's knowledge the disease had been observed five times in the canton in 40 years.

An interesting account of an outbreak among cattle in the U.S.A. is given by Shope (1931)[3]. In this outbreak there were twelve animals, and of these nine succumbed, three remaining unaffected. The symptoms resembled those described by Strebel. "The animals became progressively weaker and died within 36 to 48 hours after the first evidence of illness, except in one case. This animal was ill for six days and lay listlessly in the barn lot during this period, and failed to show any evidence of pruritus. On the last day, she developed clonic convulsions, salivated and died in much the same manner as the others." Curiously enough, this cow was the only one of Shope's animals to furnish him with a virus with which he could transmit the disease to laboratory animals. Injected intracerebrally the material from the brain of this cow produced a uniformly fatal disease in rabbits, guinea-pigs and mice. Shope also gave a description of the *post-mortem* appearances:—

"The *post-mortem* picture of cattle dead of the disease was always the same. The skin over the thighs and buttocks was denuded of hair, dark, leather-like and smeared with a sero-sanguineous fluid. The subcutaneous tissues were thickened, dark red and occasionally a gelatinous material was seen. The lungs of some of the cows exhibited areas of an oedematous type of congestion; the hearts of all were spotted with numerous petechial haemorrhages and in all cases there was an excess of pericardial fluid. There was moderate injection of meningeal vessels but no gross changes were seen in the central nervous system."

The occurrence in this country of a disease resembling "mad itch" is of interest and in the event of a further suspected case occurring at any time, it is to be hoped that the early collaboration of a laboratory, with facilities for transmission experiments, will be sought.

Although the attempts made by one of us (J.R.) in the present instance, to confirm the tentative diagnosis of "mad itch" by the inoculation of different experimental animals with suspensions of nervous tissue yielded no positive results, this failure to transmit the disease would not exclude "mad itch" in view of Shope's inconstant results (*v. supra*) in transmission experiments with material taken directly from affected cattle.

References

[1] "A Peculiar Itch Disease of the Ox." *J. Comp. Path.* (1889.) 2. 271.

[2] Udall, D. H. "Pseudorabies." Practice of Veterinary Medicine, New York.

[3] Shope, Richard E. (1931.) "An Experimental Study of 'Mad Itch' with Especial Reference to its Relationship to Pseudorabies." *J. Exp. Med.* 54. 234.

* * * * *

Multiple Subcutaneous Round-Celled Sarcomata in a Thoroughbred Mare

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AND

G. O. DAVIES

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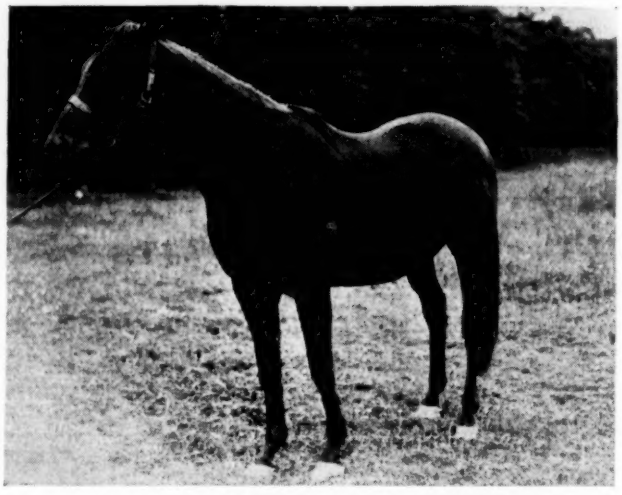
Subject.—Brown thoroughbred mare, Amathea, by Busy out of Catrine; 14 years of age.

History.—When mated to Twelve Pointer in April, 1936, this mare showed no trace of disease but two months later showed numerous subcutaneous, clearly-defined, tumour-like lesions particularly on the near side of the neck and body. It was at this stage that the writers first saw the mare at the invitation of Major Hopkin, M.R.C.V.S., Manchester. The extent of the lesions at this stage can be seen in the photograph No. 1, taken in July, 1936, for which we are indebted to Major Hopkin.

We are informed that the mare foaled normally, but that the foal died shortly after birth, due to want of nourishment.

It is of interest to note that Catrine (Amathea's mother) was similarly affected when about 12 years old, Amathea being then *in utero*. Catrine had one more foal, a colt, after Amathea, and although it was considered very doubtful that she would have, and rear, a foal when in such a condition, she reared a very good animal. Until two years ago, this colt had not shown any such condition as is presented by Amathea. Young Farrimond, a



No. 1.—Brown Thoroughbred Mare—July, 1936.

half-brother to Amathea, and whose sire was Farrimond, was 16 years old at the time of our visit and up to then had also shown no trace of this affection.

Between July, 1936, and October, 1937, the mare was kept under observation by Major Hopkin and on the latter date was sent to the Department for examination prior to destruction.

Examination.—When received, the mare was in very poor condition and showed slight oedematous swellings at the extremities of all four limbs. There was also a scanty yellowish-white nasal discharge. Numerous round, well-defined, subcutaneous swellings varying in size up to that of a saucer were apparent but the most noticeable feature was that the swellings were most prominent on the "off" side. Most of those which were evident at the first examination seemed to have disappeared or were reduced in size, whereas others had made their appearance in other situations chiefly on the other side of the body. Their actual size was somewhat obscured by the length of the coat.

No. 2.—Brown Thoroughbred Mare—October, 1937.

The appetite remained good.

The state of the mare at this time is shown in photograph No. 2.

Examination of the faeces revealed approximately 54 strongyle eggs per gramme of faeces.

The results of the blood examinations were as follows and the approximate normal values are also given for comparison :—

	Mare.	*Normal (approx.)*
Red blood corpuscles	7 millions	7-8 millions
Haemoglobin ..	14 grms. per 100 c.cs.	15·5 grms.
Leucocytes	10,000	10,000
Neutrophiles ..	45%	57%
Lymphocytes ..	33%	35%
Eosinophiles ..	12%	3·25%
Monocytes	9%	4·25%
Basophiles	1%	0·25%

Urine examinations for albumen, bile salts and pigments, glucose and acetone bodies were negative. The specific gravity was 1023. Calcium carbonate crystals were found in the centrifugalised deposit. On rectal and vaginal examinations the uterus was found to contain no foetus.

Post-mortem examination.—The mare was destroyed on November 5th, 1937, and the following lesions were found :—

Several small tumours were found at the entrance to the chest and alongside the left jugular furrow either in chains or in groups. Some were attached to the muscles. Individually they varied in size up to that of a hazel nut. A large tumour about the size of a pullet's egg was present over the shoulder and another over the side of the abdomen fused with the muscle. Several small ones were also found behind the elbow and a few on the inner aspect and behind the hind limbs.

The tumours were firm, somewhat flattened but rounded in outline, close-grained on section and greyish-pink in colour.

The neighbouring lymphatic glands were normal. There was some subcutaneous oedema of the lower abdominal wall and extremities.

The internal organs showed the following changes :—

Heart—dilation of the right ventricle.

Lungs—a few calcified round nodules up to the size of a pea and easily enucleated. They were probably parasitic.

Liver—a few small calcified nodules about the size of a pinhead under the posterior surface of the liver. They were readily enucleated.

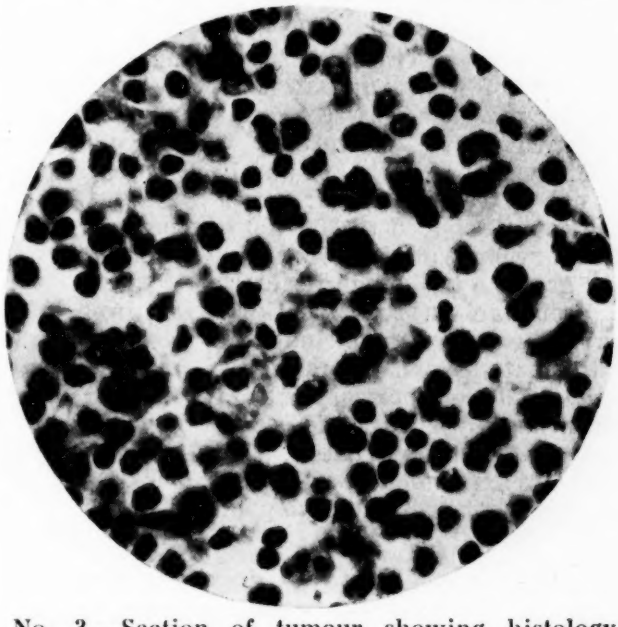
Spleen—this weighed 4½ lb.

Stomach—numerous bots attached to the cuticular portion of the mucous membrane.

Caecum and double colon—numerous strongylidae present, chiefly *Strongylus vulgaris*.

Aneurysms—three aneurysms were present in the direct colic artery. They were cylindrical in shape and contained red thrombi and several strongyles. There was also a large aneurysm about the size of a goose egg situated at the root of the anterior mesenteric artery. It also contained a red thrombus and many strongyles.

Histology of the tumours.—Sections were prepared from representative portions of the tumours, and these were found on microscopic examination to be largely cellular. The cells were for the most part like those of a round-celled sarcoma but among them were cells of a larger size; some round, some oblong and others tailed. A few of the larger cells contained 3, 4 or 5 round nuclei (see photomicrograph).



No. 3.—Section of tumour showing histology described in text. x 700.

The vessels in the tumour were well-formed and there were no haemorrhages. From the histology, the tumour was diagnosed as a round-celled sarcoma. The remarkable feature was that although the tumours were multiple, they showed no tendency to metastases in any of the glands or internal organs. Furthermore, they showed no tendency to invade neighbouring tissues and there was no leucocytic infiltration.

The writers are aware that tumours of this nature have already been described in the horse. Anderson (1913) described a similar case in the *Journal of Comparative Pathology and Therapeutics*, **26**, 52, and one of the writers (J.F.C.) has seen two similar cases in Ireland.

The interesting points regarding this case are (1) the dam of the mare was similarly affected late in life, (2) the dam of the mare was affected while carrying Amathea, the subject of the present note, and (3) the disappearance or decrease in size of lesions in certain situations and the later development of lesions in other parts of the body.

ABSTRACTS

[**Parasitic Gastritis. The Transference of the Causative Helminth from Sheep to Cattle.** Taylor, E. L. (1937.) *Vet. J.* **93.** 10. 353-355.]

In this paper the author refers to an outbreak of parasitic gastritis which caused the deaths of a number of yearling cattle. These had been grazing on the same pasture as a flock of lambs. The causal helminth in this case was *Trichostrongylus axei* (synonyms *Strongylus gracilis* and *Trichostrongylus extenuatus*). This worm was first found in the stomach of the horse.

The author subsequently carried out an experiment at Weybridge, in which he put two young bovines on to a pasture on which infected sheep had been grazed. These animals became heavily infested, and after a time developed severe parasitic gastritis and were removed for treatment. Eventually they recovered. Their egg counts were 500 and 1,000 per gramme at one time, but as their faeces became watery the count dropped to 300-400 ova per gramme. The author considers from 500 to 1,000 ova per gramme to be high for cattle.

From the outbreak mentioned and from this experiment, Taylor concludes that trichostrongylid nematodes can be transferred from sheep to cattle under ordinary agricultural conditions and that the disease parasitic gastritis can be transferred from sheep to cattle. [It is to be regretted that the experimental calves were not destroyed and the nematodes definitely identified.]

W. A. W.

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[**Toxicity of Arrowgrass for Sheep and Remedial Treatment.** Clawson, A. B., and Moran, E. A. (1937.) *Tech. Bull. No.* 580. *U.S. Dept. Agric.*]

It is known that at certain times and under certain conditions arrowgrass (*Triglochin maritima*) is poisonous both for cattle and sheep, the active principle being hydrocyanic acid, and the present experiments were carried out to determine these conditions more precisely.

The grass was collected from various districts and, after it had been ground to a uniform degree of fineness, carefully weighed samples were given to sheep by means of a stomach tube. It was found that the green leaves were the most toxic part of the plant, 0·3 to 0·4 per cent. of the animal's weight being sufficient to cause symptoms of poisoning. When moderate quantities of water are available during the growth of the plant, the leaves are less poisonous than when it has grown under drought conditions. The leaves, however, are most poisonous when the plant has made part of its growth in standing water and the remainder after the water has receded and the soil become dry. Drying the leaves in direct sunlight did not reduce their toxicity and leaves which had been kept for six months were still toxic; even heating them with steam for three hours did not render them harmless.

Treatment consists in the intraperitoneal injection of 1 gramme sodium nitrate and 2 grammes sodium thiosulphate in 20 per cent. water. If the treatment is not given almost immediately or if more than one and a half times the lethal dose has been eaten, the chances of recovery are slight.

J. A. N.

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[**The Cause of Lactation.** Koch, W. (1937.) *Münch. tierärztl. Wschr.* **88.** 23 and 24. 265-268 and 282-285.]

Since lactation is so closely related to sexual activity, it is natural to presume that there is a relationship between the reproductive and mammary glands. This connection is not through the nervous system since the secretion of milk occurs at the proper time even when all the nerves to the mammary glands have been divided. Mammary tissue transplanted to other parts of the body will also secrete at the proper time so that the stimulus must be carried by the blood stream and is, therefore, probably a hormone or hormones.

Three processes are involved in lactation; the development of the mammary tissue, the onset of the secretion of milk and lastly, the continuance of the secretion.

It is now fairly certain that oestrone is responsible for the growth and development of the mammary tissue. It may be that the production of this substance in increasing amounts during pregnancy is for this purpose, although it is possible that oestrone is not the sole factor concerned since there are animals, *e.g.*, sheep, dogs and cats, in which the amount of oestrone in the blood stream does not increase during pregnancy. However, recent experiments have shown that it is possible to produce the secretion of milk in non-pregnant animals by the repeated injection of oestrone.

The part progesterone, the hormone produced by the corpus luteum, plays in milk secretion is still obscure. The most recent experiments show that contrary to the antagonistic effects of oestrone and progesterone on the ovary, progesterone enhances the action of oestrone on mammary tissue.

These hormones, however, are not responsible for the actual secretion of milk and numerous theories have been put forward to account for it. It may be that the actual secretion of milk only takes place when the intensity of the reaction produced by oestrone has subsided or that parturition itself stimulates the secretion of milk; on the other hand, the posterior pituitary may be involved. It is becoming more certain, however, that the anterior pituitary plays an important part in the secretion of milk. Numerous experiments have shown that it produces a substance, prolactin, which has a

specific action on mammary tissue when fully developed, and that removal of the anterior pituitary may lead to the cessation of the flow of milk.

The continuance of the secretion of milk is probably brought about by the mechanical stimulus of suckling and little more can be said about it at present.

In conclusion, it must be borne in mind that other hormones, *e.g.*, insulin, thyrotropic hormone, etc., may affect the secretion of milk and that there is still much to discover in this connection. J. A. N.

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[**Pathogenesis and Histogenesis of Tuberculosis in the Calf following Oral Administration of Culture.** Dobberstein and Wilmes. (1937.) *Arch. Tierheilk.* **71.** 6. 427-439.]

Forty-one ten-day old calves which were free from tuberculosis were exposed to infection with a culture of bovine tubercle bacilli. The single dose was administered to one-half of the calves in capsules and to the other by suckling milk. After varying periods up to 149 days, the calves were killed and all the organs examined carefully for the presence of tuberculous lesions, histological examinations being made of all the organs which were likely to be the locus of microscopic lesions. Twenty calves were affected with tuberculosis, twelve of which showed alimentary lesions which were apparent 29 days after infection. Lesions in the intestinal mucosa were very small and generally confined to the Peyer's patches. Lesions of the mesenteric glands accompanied those in the intestine in all cases, thus forming a complete complex at the site of primary infection. The pharyngeal glands of sixteen calves were affected, the lesions being detectable microscopically 22 days after infection ; in only three calves was the tonsil involved. Two calves which had been infected with culture in capsule showed lesions of the pharyngeal glands and, to explain this, the author states that infection must have taken place during regurgitation. Tuberculosis was also found in the following sites : in the liver of one calf the hepatic glands of three calves, the lung and pleural lymphatic glands of three calves, the pleural glands of one calf. Macroscopic evidence of calcification of the lesions was first found 88 days after infection.

S. J. E.

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[**The Rapid Recognition of Pathological Substances in Urine.** Lipp. (1937.) *Münch. tierärztl. Wschr.* **88.** 505-507.]

The sulphosalicylic acid test is by far the most satisfactory test for the recognition of protein in urine but it may give a precipitate if much calcium or albumoses are present. Negative results may be obtained if the urine is alkaline in spite of the presence of protein. Ballon's test is also useful for this purpose. The urine is acidified with acetic acid and ammonium molybdate solution allowed to trickle down the side of the tube. If protein is present, a white ring forms at the junction of the two liquids. Albucit, metadioxybenzol, is also a useful substance for the detection of protein. A few drops of urine are placed in a watch-glass and a pinch of the powder added. If protein is present, the liquid becomes turbid, the turbidity being clearly seen if the watch-glass is held against a dark background.

The usual reducing agents should be used for the detection of sugar. Fehling's solution may be reduced if much creatinine is present and if the urine is very acid the reaction may not occur. Saccharit powder gives quick and accurate results. A pinch of the powder is mixed with a drop of urine; if sugar be present a deep, grey colour is produced.

Blood, bile pigments and pus should also be tested for by the usual methods. A useful reagent for the detection of pus is provided by pyocit, a powder which when added to urine containing pus produces frothing owing to the breakdown of hydrogen peroxide. J. A. N.

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[**The Occurrence and Importance of Salmonella in Dogs.** Reichardt (1936.) *Zeit. f. Veterinark.* **48.** 465-475.]

Attempts were made to isolate and differentiate salmonella bacteria from dogs which were two to three months old and either suffering from distemper or from some condition simulating it. The bacilli were identified by biochemical tests and by the use of two samples of immune sera only—one prepared against *S. enteritidis* and the other against *S. typhi-murium*. [The tests were not stringent.]

Of 206 cases examined after death from distemper, it is claimed that salmonella bacteria were found in one or more organs in 54 cases—26·21 per cent. The greater number were found in the intestinal glands, spleen, liver or bile. The strains were considered to be *S. enteritidis* (15) and *S. typhi-murium* (39).

From the organs of 101 cases of distemper-like disease, salmonella bacilli were found in 61 cases—60·39 per cent. The greater proportion was found in the liver, intestinal glands, spleen and bile ; 32 strains were stated to be *S. enteritidis* and 29 *S. typhi-murium*.

No salmonella bacteria were isolated from the faeces of 56 cases of distemper and possibly only one from 441 cases of distemper-like disease. *S. typhi-murium* was isolated from the gut scrapings of four of 28 distemper dogs.

The sera of various dogs were examinedf or their agglutinin content but in no case was a high titre recorded. The article discusses the possible danger of the spread of salmonella from dogs to other animals and of their playing some part in the aetiology of food poisoning.

R. L.

REPORT

The Ministry of Agriculture and Fisheries

REPORT OF THE PROCEEDINGS UNDER THE DISEASES OF ANIMALS ACTS FOR THE YEAR, 1936.*

Whilst this report is one which is referred to every year in our columns, it is one which might with advantage be purchased annually by every veterinary surgeon.

It is presented under the following headings: Part I. Incidence of the Notifiable Contagious Animal Diseases in Great Britain; Part II. Importation of Animals, etc.—Preventive Disease Measures; Part III. Protection of Animals and Poultry during Transit by Sea, Rail and Road; Part IV. Certification of Exported Pedigree and other Livestock and Animal Products; Part V. Miscellaneous, including (1) a report of the annual proceedings of the International Veterinary Bureau in Paris, (2) Warble Fly (dressing of cattle) Order of 1936 and, finally, a report of the Director of the Veterinary Laboratory at Weybridge.

Appendices are given containing detailed statistics.

The data given in Table II of Appendix 1 show the trend of incidence for the last five years for most of the diseases classified according to the animal concerned and as reproduced below.

Foot-and-Mouth Disease.—During the year 1936, there were 67 outbreaks of foot-and-mouth disease, of which 63 occurred during the last four months. These outbreaks arose from 13 new centres of infection and in twelve their origin could not be traced to another outbreak in this country. Readers will have observed from the columns of this journal that there has been during 1937 a very considerable increase in the number of outbreaks of foot-and-mouth disease, associated probably with a widespread and very serious epidemic which has raged on the Continent since May, 1937. The established procedure in this country remains substantially unaltered and so far has been vindicated by the small amount of spread in this country compared with that which has occurred in continental countries. There would seem, however, to be room for some tightening of the regulations, particularly with regard to per-

*London, published by His Majesty's Stationery Office. Price 1s. 6d. (postage extra).

Disease.	Years.	Counties.	Out-breaks.	Animals Attacked or Slaughtered.†							
				Cattle.	Sheep.	Swine.	Horses.	Goats.	Canines.	Felines.	Other Animals.
Anthrax ...	1932	61	344	373	3	33	4	—	5	—	—
	1933	55	297	335	1	4	5	—	—	—	—
	1934	61	395	423	5	18	2	—	1	4	—
	1935	61	386	418	6	15	1	—	1	—	2
	1936	63	468	500	1	27	5	—	1	—	17
Foot-and-Mouth ... Disease ...	1932	11	25	629	1,608	416	—	—	—	—	—
	1933	23	87	3,359	3,084	1,359	—	3	—	—	—
	1934	15	79	2,724	5,173	2,378	—	27	—	—	—
	1935	12	56	2,900	7,000	2,543	—	1	—	—	—
	1936	14	67	2,504	1,737	1,072	—	3	—	—	—
Parasitic Mange	1932	36	127	—	—	—	204	—	—	—	—
	1933	38	132	—	—	—	225	—	—	—	—
	1934	31	115	—	—	—	191	—	—	—	—
	1935	32	99	—	—	—	222	—	—	—	—
	1936	35	111	—	—	—	254	—	—	—	—
Sheep Scab ...	1932	39	361	—	—	—	—	—	—	—	—
	1933	38	578	—	—	—	—	—	—	—	—
	1934	41	684	—	—	—	—	—	—	—	—
	1935	41	477	—	—	—	—	—	—	—	—
	1936	41	255	—	—	—	—	—	—	—	—
Swine Fever ...	1932	69	1,555	—	—	757	—	—	—	—	—
	1933	62	1,414	—	—	901	—	—	—	—	—
	1934	66	1,833	—	—	1,031	—	—	—	—	—
	1935	68	2,049	—	—	1,238	—	—	—	—	—
	1936	68	1,873	—	—	1,270	—	—	—	—	—

†Figures for anthrax and parasitic mange relate to animals attacked.
Figures for foot-and-mouth disease relate to animals slaughtered as diseased or as having been exposed to infection.
Figures as to the number of animals attacked by sheep scab are not recorded.
Figures for swine fever relate to animals slaughtered for diagnostic purposes only.

sonnel over which little control apparently exists. It is worthy of note that 40 outbreaks arose in 1936 from one set of premises by way of two markets.

Tuberculosis.—The number of cattle slaughtered under the Tuberculosis Order of 1935 increased somewhat, *viz.*, 23,716. The compensation paid per head also increased. The reason would appear to be that diseased cattle are being detected and slaughtered at an earlier stage. The number of cases of "advanced" tuberculosis decreased by 2 per cent., as compared with 1935, whilst that for tuberculous emaciation had dropped in 1936 to 20·5 per cent. as against 31·4 per cent. in 1934. The slow progress of the attested scheme of 1936 is remarked on.*

Sheep Scab.—A marked improvement in the sheep scab position occurred in 1936, and justified the stronger measures which the Ministry put into operation some two or three years previously. Emphasis is laid on the necessity for constant vigilance and a thorough investigation into each outbreak of disease if the improvement is to be maintained.

Swine Fever.—The figures for 1936 show that the number of outbreaks of swine fever reported and percentage (12-13%) confirmed had been approximately similar for the preceding five years. In 1936, 37 per cent. of the pigs on infected premises died, representing rather less than 1 per cent. of the total pig population of Great Britain. Roughly, 50 per cent. of the outbreaks were attributed definitely or probably to market infections. 82·5 per cent. of the outbreaks occurred in the scheduled area for the regulation of Movement of Swine Order of 1922. This area, at the end of 1936, included (1) the whole of England, except Cumberland, Northumberland, Westmorland, and certain areas of Lancashire and Salop. (2) Glamorganshire and Monmouthshire in Wales, but no part of Scotland.

Swine Erysipelas.—Two thousand and forty-four cases reported as swine fever were found to be swine erysipelas, that is an increase of one-third as compared with the average of the proceeding five years.

Anthrax.—Of 614 suspected outbreaks, 468, or 76·2 per cent., were confirmed, and the total animals concerned were 551, of which nearly all were cattle; 380 outbreaks occurred on farms which had not had another outbreak during the previous five years. Details are given of the circumstantial evidence which suggests that imported feeding stuffs and artificial manure of animal origin played a large part.

Parasitic Mange.—This disease showed a small increase.

Poultry Diseases.—New orders came into operation in 1936, providing for the compulsory notification of diseases suspected of being fowl-pest (including Newcastle disease); for the control of the importation of live poultry and of eggs intended for hatching; and to prevent the spread of infection at markets.

Diseases of Animals (Importation of Therapeutic Substances) Order of 1936.—The main objects of this Order are to require that vaccines, sera, toxins, antitoxins and antigens; salvarsan and analogous substances used for the specific treatment of infective diseases; and pituitary extracts shall be properly labelled. And to control by means of licences, the importation of contagious abortion vaccine; importation is now limited to dead vaccine.

The Diseases of Animals (Disinfection) Order of 1936 sets out more clearly the conditions which must be complied with before a disinfectant is officially recognised as satisfactory.

Satisfaction is expressed with the measure of observance accorded to the Warble fly (Dressing of Cattle) Order of 1936, although certain difficulties have been met with.

The report of the Director of the Veterinary Laboratory at Weybridge records increased accommodation, which has added to the facilities available for research, additional premises having been provided for cattle, small laboratory animals and a new unit for poultry. Details are given of the routine diagnostic service, regarding abortion vaccine, BCG vaccine, poultry agglutination tests, fowl-pox vaccine, avian typhoid vaccine and immunisation against piroplasmosis and anaplasmosis for export abroad. Research has been continued on contagious abortion, on tuberculosis (particularly with regard to skin tuberculosis) the resistance of swine fever virus, the rabies-like disease of Trinidad, parasitic gastritis, syngamiasis, the pathogenicity of poultry parasites in relation to nutrition, metabolic disorders of farm animals and infectious laryngotracheitis of poultry.

A. W. S.

*Reference to the latest figures available (see *Veterinary Record*, February 12th, 1938, p. 192), shows, however, that since the introduction of modifications into the Attested Herds Scheme in June, 1937, the rate of progress has much improved.

DEATH SENTENCES ON RUSSIAN VETERINARIANS

A *Reuter* message from Moscow, on Monday last, announced that, on that day, eleven veterinary surgeons were sentenced to death at Ordzhonikidze. They had been accused of systematic wrecking of agriculture, of causing the death of 90,000 cattle since 1932, and of carrying out bacteriological warfare against the Government and the Red Army by spreading typhus bacilli resulting in the mass poisoning of civilians and soldiers.

N.V.M.A. DIVISIONAL REPORT

Central Veterinary Society

The main item of business occupying the attention of Fellows attending the meeting of the Central Veterinary Society (Division, N.V.M.A.) held at the Conway Hall, Red Lion Square, W.C.1, on January 6th, 1938, was the discussion of a letter from the "National" relative to the organisation of schemes for the treatment of sick animals of the poor. Following their prolonged consideration, the proposals put forward by the Organising Committee of the Association for the improvement of the schemes now operative for the provision of centralised and decentralised clinics carried on by the R.S.P.C.A., in association with the N.V.M.A., failed to find favour as a whole and it was agreed to forward other suggestions for the amendment of the schemes.

The President of the Society (Professor J. McCunn) occupied the chair and there were also present Messrs. L. S. Balls, W. F. Barton, W. Brown, G. N. Bushman, H. E. Bywater (Hon. Secretary), Major W. Denington, Captain H. S. A. Dunn, Miss C. M. Ford, Captain F. C. Gillard, Lieut.-Col. H. Greenfield, Dr. Tom Hare, Mr. S. F. J. Hodgman, Messrs. H. D. Jones, Herbert King, H. C. P. King, Lieut.-Col. G. P. Knott, Mr. T. H. Michie, Mr. W. Perryman, Mr. G. W. Searles, Mr. J. S. Steward, Miss M. Stewart, Miss O. Uvarov, Mr. F. W. Willett and Mr. R. A. Willett. Miss C. M. Scott was present as a visitor.

The minutes of the November (Annual Dinner) meeting, having received publication in *The Veterinary Record*, were confirmed and signed; confirmation of the minutes of the December meeting was deferred, pending their publication.

Correspondence.—The correspondence, other than a letter from Mr. J. F. D. Tutt on the centralisation of public veterinary services, consideration of which was deferred until later in the proceedings, was confined to apologies for inability to attend, received from Mr. C. Formston, Mr. J. W. H. Holmes, Major-Gen. Sir John Moore, Lieut.-Col. W. S. Mulvey, Mr. C. W. Ottaway and Professor G. H. Wooldridge.

Nominations for and Elections to Fellowship.—The nomination was made of Mr. H. W. J. Hossack, of 100, Luton Road, Harpenden, on the proposition of Major Denington, seconded by the President, and the following elections to Fellowship were made unanimously: Mr. E. F. McCleery, Ardlui, Chase Side, Southgate, N.14 (Proposed by the Hon. Secretary; Seconded by the President); Mr. F. P. E. Rickard, The Hollies, North Road, Woking, Surrey (Proposed by Major H. W. Kirk; Seconded by Mr. C. Formston); Mr. J. T. Turney, Town Hall, E.15 (Proposed by the Hon. Secretary; Seconded by the President).

Case Records and Morbid Specimens.

Mr. S. F. J. Hodgman exhibited the kidneys and bladder from a six-year-old Pekingese, saying that the case was sent to him by his partner and that he was asked to operate for cystic calculi. He removed five, the largest the size of a five shilling piece. The animal was due to go home in five days, but the owners did not come for it and on the night after the day arranged for its departure it had developed a temperature of 106°. Prontosil was given and in two days the temperature was down to 103° On the 14th day, however, the dog died, and on *post-mortem* examination, it was found that one kidney was almost four times the size of the other. It was opened by his partner and found to contain pus.

Lieut.-Col. H. G. Greenfield said that he would like to record a case which, he thought, might interest them. The subject was a large fox terrier, weighing 35 lb. and six years old, which had its first puppies about July of last year; they were enormous puppies, cross-bred as the result of an accidental mating. They did perfectly well, but in a little while the bitch had milk fever, which seemed to be due to calcium deficiency; however, she got quite all right again. Six weeks afterwards, he was called in to see this dog, which he knew well, the information being that she was vomiting and coughing. He found the pulse to be 165 and that she was breathing 84 to the minute stertorously, the temperature being 106°. He took the dog to the surgery and retained her there under observation for a matter of 13 days. During that time she appeared for the first few days to respond to treatment for a weak heart, a very congested liver and infiltration of the lung. The pulse rate dropped to approximately normal, and the dog appeared normal and was feeding well. On the fifth day, however, she vomited again and the animal lost condition very rapidly, its state becoming such that within a week it was destroyed.

On *post-mortem* examination, he found the lungs normal and liver slightly degenerated, but the dog had two huge and extraordinary kidneys. He took them to the pathological laboratory at the Royal Veterinary College where it was found that in both cases there was virtually no normal kidney tissue remaining and that both were practically enormous carcinomas.

Dr. Tom Hare observed that the case of kidney carcinoma interested him. In puppies, congenital malignant neoplasia was met with

and gave rise to considerable difficulty so far as diagnosis was concerned. One was inclined to associate malignant disease, particularly of the internal viscera, with mature or old age; in puppies, the possibility of such growths might not occur to one's mind. These growths were usually rapidly growing embryonal carcinomas or sarcomas, and the clinical indications one might find were an enlarged kidney on palpation and haematuria.

He would ask Colonel Greenfield if his tumour had been sectioned.

Colonel GREENFIELD replied that sections were made and a report was received from the laboratory that it was a carcinoma. There was no previous history of nephritis.

Dr. HARE observed that carcinoma in both kidneys, probably followed upon a chronic pyelonephritis, *i.e.*, an ascending infection.

Captain GILLARD said that it occurred to him as being very remarkable that there should have been so little vomition. If one was correct in assuming emesis in chronic nephritis, surely it should have been evidenced in the case they were discussing?

Dr. HARE answered that that was not necessarily so, because carcinoma would arise in the pelvis of the kidney. In Bright's disease, the cortex or secretory portion of the kidney was progressively destroyed so that the liver had to take on an extra amount of work and when it began to fail, uraemia resulted. It was a useful clinical hint when dealing with chronic nephritis, to remember that the four signs to fear were emesis, discoloration of the gums, a uraemic odour, and the presence of bile salts and pigment in the urine. In chronic nephritis, he would always "give the dog a chance," provided these four signs were not present together as an indication of inevitable death.

Colonel GREENFIELD observed that he thought that the dog did have, about a year previous, a bout of vomiting which readily yielded to treatment. Of course, that might have been the origin of the kidney trouble, but she was in great fettle then. The second point he wished to make was that the dog was in his surgery day and night and there was no vomition except on the one occasion. The outstanding characteristics of the case were at first rapid tumultuous heart and rapid stertorous breathing, followed by normality in this respect, comfort but listlessness in the animal five or six days afterwards, succeeded by tremendously rapid emaciation when the bitch could scarcely stand—all in 13 days.

Mr. HODGMAN said that in the case his partner had, there was no history of vomiting.

Organisation of Schemes for the Treatment of Sick Animals of the Poor.

Introducing the discussion on the letter on the above subject sent down by the Organising Committee of the N.V.M.A., the PRESIDENT said that all members of the Society had been supplied with a copy of the letter in order that due thought and consideration could be given to it.

It was agreed that the discussion should take place in open meeting, and that the report of the proceedings under this head be forwarded to the appropriate committee of the N.V.M.A.

The discussion was opened by Mr. H. C. P. KING, who was followed by the majority of the members present. A full and frank discussion took place and at its conclusion certain questions were put by the PRESIDENT, and, based on the answers given, the following resolution was unanimously approved:—

> "That this meeting of the Central Veterinary Society is not in agreement with the scheme for R.S.P.C.A. clinics as outlined by the N.V.M.A.
>
> "It is of opinion that veterinary surgeons should be paid for their services at centralised clinics, which should be established only in the poorer districts; also that strict conformity by the branches of the R.S.P.C.A. with the rules jointly agreed upon by the headquarters of that body and the N.V.M.A., is essential to the success of the scheme.
>
> "This Society is further of opinion that veterinary surgeons should be encouraged to establish decentralised clinics under their own control, at which animals of poor persons should be treated free or at reduced rates.
>
> "Whatever schemes are evolved, all veterinary surgeons in the districts concerned should be invited to co-operate."

Any Other Business

The PRESIDENT said that, under the heading of "Any other business," they would now take the letter from Mr. J. F. Tutt, of Winchester, who was a member of the Society. It dealt with the scheme of the Ministry of Agriculture for the centralisation of public veterinary services, and he would ask the Secretary to read it.

The sections of Mr. Tutt's letter relative to this matter were as follows:—

> "In view of the information, now to hand, over the centralisation of public veterinary services, may I urge that your Council should at this meeting consider the imperativeness of urging the 'National' to stop wasting time with an individual minister, and to place the full facts of their case before the National Farmers' Union and allied agricultural bodies, at once.
>
> "Agriculture is the one industry most closely connected with us, and it can command a certain number of votes in the House of Commons. We should, therefore, not only ally ourselves with it, but seek the support of those who are aware of the valuable services rendered to them in the past by the general practitioner and who now

the Minister proposes to replace by young graduates lacking the experience necessary, not only to ensure the success of the scheme, but also the ability to inspire confidence. The stock-owner and the average herdsman of to-day, are more intelligent than they were 20 years ago and I do consider that the minimum period of three years' practical experience, urged by the 'National,' as the essential period of qualification for such posts, must be so regarded.

"I think that those of your members who are engaged in cattle practice will agree, that of the four diseases it is proposed to eradicate or control, contagious bovine abortion takes the greatest annual toll, followed closely by mastitis. The farmer does not lose so much over tuberculosis—in many cases he gets very good compensation—and Johne's disease can safely be relegated to the bottom place. For this reason, the inclusion of the private practitioner is essential, if the scheme is to be the success that we all desire it to be."

The PRESIDENT observed that probably most of those present would know of the new scheme that was being evolved and which was heralded at the outset as a sort of Eldorado for veterinary surgeons—he mentioned it in his presidential address. The scheme also started off with a great air of secrecy. Ordinary members of the profession knew nothing about the negotiations, because the N.V.M.A. Committee which was dealing with the people in power were sworn, more or less, to secrecy. The other day, however, much to everybody's surprise, full details were published in the agricultural papers, which was a most serious thing.

In the opinion of many members of the profession who knew a little about it, this Eldorado was a somewhat nebulous one. Many of the whole-time people had been placed in a very peculiar position: many of them did not know what their position would be under the new scheme. Moreover, although it was promised that the practitioner should have a great part in the scheme, they now discovered that it was intended to dispense with his services as soon as the Ministry could do so.

The "National" were putting up a fight to enable the profession to get its due rights under the scheme, and he thought it would help the N.V.M.A. very much and shorten a lot of discussion there that evening, if they were to send the "National" a resolution from that society in which they expressed strong support for the efforts that they were making on behalf of the profession at the present time with reference to the new Agriculture Act.

Little time remained for the discussion of the matter that night, but brief observations would be welcomed.

Mr. G. W. SEARLES said that he would like to suggest that the "National" should expedite their efforts. What was to be done needed to be done quickly.

Mr. J. S. STEWARD observed that he was certain that all wanted to do what they could to help and to support the "National" in this matter—(Hear, hear)—and he approved of what the N.V.M.A. had been doing. He could not help feeling, however, that if they were too bombastic with a strong person like the present Minister of Agriculture, they might do more harm than good. If they could make any suggestions, however, as to the way in which the Ministry might make use of the practitioner, it might be of value.

The following resolution, proposed by Mr. H. C. P. KING, and seconded by Mr. R. A. WILLETT, was now passed unanimously, for forwarding to the N.V.M.A.:—

> "That this Society is alarmed at the apparent menace to practitioners and part-time local authority inspectors and agriculture, and the hardships which may be inflicted upon certain whole-time inspectors, in the new Centralised Veterinary Service Scheme, and wholeheartedly supports the efforts of the N.V.M.A. on behalf of the community to develop the professional services in the best interests of agriculture.
>
> "This Society deplores the decision of the Minister of Agriculture not to meet in person the representatives of the N.V.M.A. for the further consideration of points in discussion with the Association."

The meeting was then brought to a close, the President being accorded a hearty vote of thanks for his conduct of the proceedings.

H. E. BYWATER, *Hon. Secretary.*

HUNTERIAN ORATION

The Hunterian Oration will be delivered before the Fellows of the Hunterian Society in the Mansion House, on Monday evening, February 28th, at 9 p.m., by Sir Frederick Hobday, C.M.G., F.R.C.V.S. The title is "John Hunter—Pioneer of Veterinary Science." Members of the profession and their friends are invited to attend.

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HORSE RIDING IN EPPING FOREST

The question of horse riding in Epping Forest has continued to receive the attention of the Epping Forest Committee. It is believed that the setting aside of "rides" to which riding is confined in certain areas of the Forest has proved successful. It has preserved Forest land and been satisfactory both to riders and the general public.

It has therefore been decided to continue the policy, and for that purpose the Forest has been divided into two areas—a northern part and a southern part, separated by a line east and west of Grimston's Oak, Chingford. Certain rides will be maintained in the northern section, and, if necessity arises, certain areas will be closed temporarily to horse riders to enable the land to recover. In the southern part it has been decided to prohibit horse riding altogether, except over and along certain rides which will be indicated by notice boards and demarcated by posts.

Notes and News

The Editor will be glad to receive items of professional interest for inclusion in these columns.

Diary of Events

Feb. 28th.—Meeting of the Editorial Committee, N.V.M.A., at 36, Gordon Square, W.C.1, 4 p.m.

Mar. 2nd.—Special Meeting of Council, N.V.M.A., at 36, Gordon Square, W.C.1, 2.30 p.m.

Mar. 3rd.—Meeting of the Central Division, N.V.M.A., at the Conway Hall, W.C.1, at 6.30 p.m.

Mar. 4th.—Yorkshire Veterinary Medical Society, dinner and dance, Guildford Hotel, Leeds, March 4th, at 7 p.m.

Mar. 12th.—Annual General Meeting of the North of England Division, N.V.M.A., at Newcastle-on-Tyne, 11 a.m.

April 1st.—Annual fees payable to R.C.V.S.

April 6th & 7th.—R.C.V.S. Committee Meetings.

April 8th.—R.C.V.S. Committee and Council Meetings.

May 5th.—Last day for nomination for election to R.C.V.S. Council.

May 16th.—R.C.V.S. Examination in Animal Management begins.

May 19th.—R.C.V.S. Annual Report and voting papers issued.

May 26th.—Last day for return of voting papers, R.C.V.S. Council election.

June 2nd.—R.C.V.S. Annual General Meeting. Election of Council.

June 9th & 10th.—D.V.S.M. written examination.

June 13th.—D.V.S.M. oral examinations begin.

June 22nd & 23rd.—R.C.V.S. Committee Meetings.

June 24th.—R.C.V.S. Committee and Council Meetings.

June 30th & July 1st.—R.C.V.S. written examinations.

Aug. 21st-25th.—Thirteenth International Veterinary Congress, Interlaken.

Sept. 5th-9th.—Annual Congress, N.V.M.A., at Glasgow.

Aug. 26th-27th.—Thirteenth International Veterinary Congress, Zürich.

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PERSONAL

Appointment.—Among the appointments recently made by the directors of the L.M.S Railway is the transfer of Mr. J. L. O'Connell, M.R.C.V.S., to St. Pancras. From being veterinary surgeon at Camden he takes up the post of district veterinary surgeon and horse superintendent in London. Mr. O'Connell is a graduate of the Dublin College and was for six years with Mr. Trevor Spencer, at Kettering.

Colonel Rainey's Appointments.—It is announced in *The Friend*, Bloemfontein, that Lieut.-Colonel J. Wakefield Rainey, C.B.E., M.R.C.V.S., formerly of the Royal Army Veterinary Corps, has been appointed to succeed Captain Moreland as Secretary, Handicapper and Treasurer to the Bloemfontein Turf Club and Secretary to the Free State Tattersalls Club.

Colonel Rainey's racing experience goes back to 1899 when, as a boy, wishing to be a jockey, he worked for some time in the racing stable of Mr. R. Robert Stark, of Mid Calder, in Midlothian, Scotland. His first experience as a racing official was when he helped the late Mr. E. Church (afterwards Clerk of the Scales at Johannesburg), to revive the racing club at Newcastle in Natal in 1902.

Subsequently he was more or less continuously occupied with racing when other duties permitted, as owner, trainer and rider in several countries until 1933, when he rode his last race and won it on his mare Patience in a three-and-a-half miles steeplechase at the Dartmoor Hunt Races, at Wrangaton, in South Devon. His experience included more than two years in Bloemfontein (1911 to 1913) when he was a prominent owner and rider and also steward of Tattersalls.

As regards handicapping, he has done much for non-professional racing, such as hunt races and gymkhanas. He has been a member of many hunt clubs such as the V.W.H. (Lord Bathurst's), V.W.H. (Crechlade), South Westmeatas, South Pool Harriers, Woolmer Drag Hunt, Cotswolds and several others.

Colonel Rainey's principal veterinary and administrative appointments were Assistant Director-General of the Army Veterinary Services, from 1915 to 1919; Chief Veterinary Officer of the Fiji Islands from 1919 to 1921; editor of the Official History of the Great War (Veterinary Services), and Director of Army Waste Products from 1916 to 1919.

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Forthcoming Marriage.—DALZELL—RUSSELL. The engagement is announced between Captain John Lawrence Dalzell, Royal Army Veterinary Corps, only son of Mrs. G. A. Dalzell, Langdale Chase, Westmorland, and Mary Elizabeth, elder daughter of Mr. F. H. Russell, Lawnscroft, Hereford.

. . . . .

Major D. S. Rabagliati's Departure from the West Riding.—At a meeting of the West Riding Diseases of Animals Committee, regret was expressed at the departure of Major Rabagliati to Edinburgh, where he has taken up the post of superintending inspector and liaison officer between Scotland and London for the Ministry of Agriculture.

A resolution was passed expressing their appreciation of the great services Major Rabagliati had rendered to the county council as well as to the whole agricultural community of the county. His going leaves a gap not only amongst the chief officials at the County Hall, but throughout the whole of the West Riding where he was so well known and appreciated.

There also took place at the County Hall, Wakefield, an interesting ceremony at which Major Rabagliati was presented with a Persian rug by the professional and clerical staff of the Veterinary Department. To mark their appreciation of the kindness of Mrs. Rabagliati at all times to members of the staff, they presented her with an antique table.

R.C.V.S. OBITUARY

New, Arthur, 127, Guildford Road, Birkdale, Southport, Lancs. Graduated Edinburgh, April 18th, 1883. Died February 16th, 1938; aged 73 years.

* * * * *

FOOT-AND-MOUTH DISEASE

An outbreak of foot-and-mouth disease among cattle at St. Mary-in-the-Marsh, Kent, was confirmed on Saturday by the Ministry of Agriculture. The area in which the movement of animals is restricted, lies in Kent and East Sussex.

A Dorset farmer was fined £30, with £2 8s. 8d. costs at Tisbury, Wiltshire, for permitting the movement, by motor lorry, of 27 animals in a foot-and-mouth disease area, and also with permitting the movement of a pig and calf when the licences had not been countersigned.

* * * * *

LEGAL NOTES

Ban for Life on Keeping Dog.—Photographs of a dog said to be "Nothing but skin and bone" were produced to Chesterfield County Justices recently, when Wilfred Hanson, poultry dealer, of 38, Searston Avenue, Holmewood, was sent to prison for 14 days for causing suffering to a dog by omitting to give it sufficient food and proper attention.

The Chairman said the case was one of the worst that had ever come before the Bench. The defendant's behaviour was heartless and brutal and, besides being sent to prison, he would be debarred from keeping a dog for the rest of his life.

The case had been brought by Inspector Fitzgerald (Sheffield) for the R.S.P.C.A., and the Society was excused payment of the usual court fees.

Contable Hardy said the dog was a cross-bred bull terrier, about seven years old. It was almost wholly skin and bone and not half the weight of a normal dog. There were sores on various parts of its body. He gave the dog biscuits and meat and it simply bolted the food. The dog was destroyed.

Mr. S. E. Sampson (veterinary surgeon, Sheffield) who was called to see the dog, said a more pitiable sight could not be imagined. A *post-mortem* examination revealed no organic disease but there was absolutely no fat on the carcase. The dog's emaciated condition was due to starvation.

Hanson expressed contrition. He said that about Christmas time the dog was ailing and he doctored it. He now realised he ought to have called in a veterinary surgeon or had the animal destroyed.

Sheep Scab Not Reported.—Believed to be the first case of its kind in Rutland, a summons for failing to notify that sheep scab existed among his sheep at Ketton, near Stamford, was preferred at Oakham, against a Rutland farmer. Defendant, who said he had no idea that his sheep were suffering from scab, was fined £2, the Chairman remarking that he had made himself liable for a fine of £145.

* * * * *

HANDBOOK OF DISEASES OF ANIMALS ACTS AND ORDERS (1937 EDITION)

Announcing the issue of a new edition of the Handbook of the Diseases of Animals Acts, 1894 to 1937, and the Orders of the Minister of Agriculture and Fisheries made thereunder, the Ministry say that the format has been designed in such a way that the Handbook can easily be kept up to date by the insertion, within the eyeleted covers, of new Acts or Orders as they are issued. "The volume is indispensable to all whose duties or work require their acquaintance with the regulations concerning diseases of animals, or who are in any way connected with the administration of the Acts and Orders.

"The Handbook includes an introduction describing certain diseases at present the subject of administrative action in pursuance of the powers conferred by the Acts, and giving a description of each disease, the names of the classes of animals that may be affected, the symptoms of such diseases, and in some instances the *post-mortem* appearances to be looked for.

"Copies of all the Diseases of Animals Acts now in operation are included, including the amendments thereto enacted by the Dogs Act, 1906, and the Exportation of Horses Acts of 1914 and 1937; together with copies of other Acts connected with animals and poultry and having some bearing upon the Diseases of Animals Acts, *e.g.*, the Protection of Animals Acts and the Slaughter of Animals Acts. The Orders contained in the Handbook include those relating to:—

(*a*) The procedure for dealing with the notifiable diseases of animals.

(*b*) The importation of animals, carcases, hay and straw, and poultry and hatching eggs, dealt with from the point of view of the prevention of the introduction of disease.

(*c*) The regulation of the exportation of pedigree stock through the London Quarantine Station.

(*d*) The disinfection of livestock markets, saleyards, lairs and of railway and motor vehicles used for animals.

(*e*) The protection of animals and poultry from avoidable suffering during transit by land and water.

(*f*) The approval of disinfectants and sheep dips for animal disease purposes.

(*g*) Therapeutic substances."

The Handbook may be purchased from the Sales Offices of His Majesty's Stationery Office, through any bookseller, or on personal application at the Ministry, 10, Whitehall Place, London, S.W.1, price 7s. 6d. (post free 8s. 1d.).

* * * * *

ROYAL (DICK) VETERINARY COLLEGE EXTENSION FUND

The committee in charge of the above Fund announce that, in consequence of the response received to appeals, it has been found possible to commence work on the extension. It appears that public support to the scheme in its initial stages has been most gratifying, the sum of £8,000 or thereby, having been contributed, and that the Executive have put in hand work to practically the full value of the subscriptions already received. This means that with the Government pound for pound grant the value of the work entered upon is in the region of £16,000.

Great efforts are being made to complete the Fund of £20,000 required, so that when the sum already subscribed has been expended there will be sufficient further funds available to allow the work to be finished without any break in continuity.

ARMY VETERINARY SERVICE

LONDON GAZETTE—WAR OFFICE—REGULAR ARMY

Feb. 18th.—The following Lieuts. to be Capts. (Feb. 18th): E. H. Lewis-Bowen, K. I. Barlow.

* * * * *

COMPULSORY PASTEURIZATION OF MILK

The Milk Marketing Board have made a strong protest to the British Medical Association in regard to their publicity campaign to demand the compulsory pasteurization of milk. The first of a series of advertisements was recently issued to the Press by the Association. Many newspapers refused to publish it on the ground that it might create a public scare. Some afterwards accepted it in a modified form.

Meanwhile the Milk Board, in representations to the British Medical Association, have declared that they also object to the modified version of the advertisement, which suggests that all unpasteurized or unboiled milk, other than T.T., is "unsafe."

The official journal of the Board declares that the Association's plunge into publicity is likely to create "an unwarranted public prejudice which can do more harm than good."

* * * * *

MARKING REACTING COWS

Identification of cows and heifers reacting to the tuberculin test was discussed recently by the Executive Committee of the Oxfordshire Branch of the Farmers' Union.

The matter was raised by Mr. B. C. Rowles, who expressed the view that there should be some protection for purchasers. Cows and heifers that reacted could be sold without any restriction, and unsuspecting farmers bought them only to find that they eventually showed signs of tuberculosis.

After some discussion, the following resolution was passed by a narrow majority:—

> "That this Branch is strongly of opinion that every cow or heifer which fails in the tuberculin test should be marked in an indelible manner, such as an ear mark, in order that purchasers may be protected, and requests headquarters to approach the Ministry with a view to regulations being framed to secure this object."

* * * * *

THE CONTROL OF DISEASES ASSOCIATED WITH ANIMAL BREEDING, WITH THE CO-OPERATION OF VETERINARY PRACTITIONERS IN SAXONY*

In Saxony more and more farmers are availing themselves of the benefits of the State voluntary scheme for the control of diseases of breeding and new-born animals. Hitherto the veterinary work involved has been done by a full-time veterinary staff under the direction of the "Tierärztekammer" (actually equivalent to a State civil veterinary service). In the future, however, it has been agreed between the Tierärztekammer and the "Landesbauernschaft" (the farming organisation to which farmers pay the dues in the voluntary scheme) that veterinary practitioners shall also assist in the scheme. Work will be delegated to them by the Landesbauernschaft, which will also remunerate them.

*Tierärztliche Rundschau (1937), No. 44, p. 739.

HIRE PURCHASE BILL TO INCLUDE LIVESTOCK

When Miss Ellen Wilkinson's Hire Purchase Bill was considered by a House of Commons committee recently, an amendment was carried extending the scope of the Bill to livestock, on the motion of Mr. R. H. Turton.

Mr. J. Gibson Jarvie, Chairman of the United Dominions Trust, Ltd., speaking in Birmingham, said that hire purchase as a social and economic factor in modern life was far too important for any Bill dealing with it to be rushed through the House of Commons as a Private Member's measure.

* * * * *

SHEEP TICK PEST

The Diseases of Animals Committee of Aberdeen County Council, recently suggested to the Ministry of Agriculture that an inquiry should be made into the problem of the sheep tick pest. A reply from the Ministry, which was read at a meeting of the committee in Aberdeen, on February 11th, after referring to a conference of experts held in London in July last, and convened by the Agricultural Research Council, stated: "The Minister is advised that tick infestation is not new, and that it does not cause serious losses *per se*. It is only when the ticks become carriers of certain diseases such as 'louping-ill' or 'tick-borne fever' that serious results may be expected. There are, however, many factors affecting the life history of the tick and the conditions necessary to enable it to infest land that are not yet fully understood, and in these circumstances the conference referred to above agreed that further research into the tick problem was necessary before any legislative action could be contemplated. Arrangements for the co-ordination of such research were also made, and steps were taken for the preparation of a programme of work on this subject for submission to the Agricultural Research Council."

Correspondence

Letters to the Editor should reach the Office not later than by the first post on Tuesday morning for insertion in following Saturday's issue.

All correspondence must bear the name and address of the contributor for publication.

The views expressed in letters addressed to the Editor represent the personal view of the writer only and must not be taken as expressing the opinion or having received the approval of the N.V.M.A.

* * * * *

AGRICULTURAL RATIONALISM AND VETERINARY SCIENCE

TO THE EDITOR OF THE VETERINARY RECORD

Sir,—Professor W. C. Miller's paper on this subject in the *Record*, of February 12th, sets out the general position admirably, and slightly modified, I should very much like to see it published in one or more agricultural paper. Mechanisation with consequent routine is a bane to many people but is essential for some. On the whole, I think it suits the average farm animal very well when used intelligently, irrational routine being shown up in one way by calves and young cattle getting the "spring feeling" when they are turned out, after being shut up for some time, *e.g.*, in winter quarters. The idea behind most modern methods is sound in principle but most of them want some additions or alteration.

The use of the milking machine and mastitis is a good example to take. It is quite definite that mastitis was far less prevalent before the machine was introduced but at the same time it is quite possible to use a machine and keep clear of any trouble. They are by no means perfect yet but the present type is used far too mechanically by men who do not think or who are incapable of doing so, the chief faults being non-observance of mastitis in its initial stage and too infrequent sterilisation of cups, etc. Chlorine solution, used nowadays, helps to cover up some of these faults.

In my opinion, we are inclined to think we know a good deal more about rations and feeding than we actually do. Who could work out a correct ration with new and unknown feeding stuffs (given the chemical analysis) and say that an animal would do so and so for certainty? Even with the present food stuffs, rations are worked out which give what are taken to be good results, but what do we really know of the quantities and balance required of the lesser-known constituents, *e.g.*, the lesser-known inorganic chemicals? When that is all worked out, what can be done with the owner who takes no notice of the variation in composition of his grass or even hay from year to year? It seems to be fairly certain that cattle, in particular, have not been getting enough minerals; for instance, Johne's disease is not nearly such a menace where plenty of minerals are fed.

One final query. Has it been definitely proved that sows in pig fed on soya beans in the ration are more likely to produce pigs that will develop anaemia? I am inclined to think that soya beans may have something to do with it.

Yours faithfully,
A. J. Baxter.

Lechlade,
Gloucestershire.
February 20th, 1938.

* * * * *

BLOOD TESTING FOR ABORTUS INFECTION

To the Editor of the Veterinary Record

Sir,—Although it can be a messy business to collect blood from the jugular vein, I should very much hesitate, unless heavily insured, and with the most docile of cattle, to attempt to take it from the mammary vein. I only did so once and, although the cow was held by the nose, I was fortunate to escape alive.

After several years' experience and the taking of several hundred such samples per annum, I consider that the jugular vein is the best vessel to collect the blood from, and with one man holding the nose and another (usually selecting the less efficient of the two) to pull on a cord, it is possible to average two animals per minute. I do not like the addition of a syringe to the needle, but I think that the Patterson holder as used in the U.S.A. would save a good deal of the messiness to which I have alluded.

In connection with *Br. abortus* infection, and as the use of a living vaccine in T.T. herds is now prohibited, I should very much like colleagues, with ample scope for research, to investigate the value or otherwise of Soluseptasine in veterinary practice, and to report if, as a result of treatment, cattle giving a positive result, later give a negative one, and if so, at what period. This preparation has been found practically—if not, indeed, quite—specific in cases of undulant fever in man ascribed to *Br. abortus* infection.

So far all our efforts have been directed towards prevention, little or no attention having been paid to those animals already infected; now that a veto has been placed on effective prevention where disposal would represent too great a loss, patent medicine vendors are reaping a rich harvest with drenches of varying composition.

Yours faithfully,
J. F. D. Tutt, F.R.C.V.S.

Winchester.
February 18th, 1938.

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SLOUGHING FOLLOWING INJECTION OF CALCIUM BOROGLUCONATE

To the Editor of the Veterinary Record

Sir,—Having been much troubled with this unfortunate sequel to milk fever treatment, I am now using the following technique, which I find satisfactory:—

(1) Remove the hair by clipping from an area approximately two inches square.

(2) Clean this area with a cotton wool swab and liquor iodi mitis.

(3) Following injection of the solution, massage the swelling until it disappears, applying at the same time about a tablespoonful of white oils.

(4) The client is instructed to massage the site of injection thoroughly, using a small quantity of white oils.

The needle used is a home-made one cut from one of Arnold's teat needles. Injection is by gravity. The apparatus is washed out immediately before use with boiling water and acid carbol. (5 per cent.). The solution is kept made up and is boiled and filtered immediately before use.

Yours faithfully,
M. R. MacFarlane.

Red Lion Street,
Spalding.
February 21st, 1938.

* * * * *

G-STREPTOCOCCUS INFECTION OF BITCHES

To the Editor of the Veterinary Record

Sir,—With reference to the very interesting paper by Drs. Hare and Fry in last week's *Veterinary Record*, I feel it might be of interest to record the fact that the Dachshund bitch, No. 2761, mentioned in the paper, has now had two beautiful puppies, the younger incontact bitch four pups, and the third bitch, which had previously had one litter but subsequently had proved sterile, has now six puppies.

All three bitches had received two courses of an autogenous vaccine prepared by Dr. Hare.

Yours faithfully,
C. S. Haselden.

Meadowlea,
Gatehill Road,
Northwood.
February 21st, 1938.

Eight hundred and ninety-four British Friesian cows with milk yields exceeding 2,000 gallons a year have been officially recorded in Britain, according to the annual report of the British Friesian Cattle Society.

TETANUS

ANTI-TETANIC SERUM

(Pasteur Institute)

standard serum — 3,000 International units.

For prophylaxis in wound cases and after operations. Confers an almost immediate immunity which lasts about three weeks.

Ampoule of 10 c.cs. . . . 1/6

✚

ANTI-TETANIC SERUM

(Pasteur Institute)

concentrated serum — 10,000 International units.

For curative treatment in acute cases of tetanus.

Ampoule of 10 c.cs. . . . 6/-

TETANUS ANATOXIN

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Prepared according to the method of Ramon and Descombey

This Anatoxin *confers an active immunity which lasts at least two years.* It is the method par excellence for systematic protection against tetanus in districts where the disease is rife.

Box containing two ampoules, each of 10 c.cs. 5/-

Leaflets, describing these products in detail and giving the full technique of use, will gladly be sent to any Veterinarian on request.

Enquiries and orders should be addressed to

GENATOSAN LTD.

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LOUGHBOROUGH, LEICESTERSHIRE.

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NOTICES

ORIGINAL Articles are only accepted on the understanding that the "Veterinary Record" has priority of publication.

Yorkshire Division, N.V.M.A.

DINNER AND DANCE

AT the Guildford Hotel, Leeds, on Friday, March 4th, 1938, at 7 p.m. for dinner at 7.30 p.m. Carriages at 1 a.m. Tickets 8s. 6d. An early application for tickets is desired as only a limited number are available.

W. T. MACGREGOR, *Hon. Secretary.*

Veterinary Department,
County Hall,
Wakefield.

Central Division, N.V.M.A.

A GENERAL MEETING of the Central Veterinary Society will be held at the Conway Hall, Red Lion Square, W.C.1, on Thursday, March 3rd, 1938, at 6.30 p.m.

AGENDA

Routine.
Elections and nominations.
Morbid specimens and subjects of professional interest.
"Some Diseases of Foxes"—C. V. Watkins.
To receive nominations for the "Dalrymple-Champneys" Prize.
Any other business.

H. E. BYWATER, *Hon. Secretary.*

North of England Division, N.V.M.A.

THE Annual General Meeting will be held in the Agricultural Department, King's College, Newcastle-upon-Tyne, on Saturday, March 12th, 1938.

PROGRAMME

11.0 a.m.—Demonstration of laboratory technique of use to veterinary practitioners engaged in the administration of the Milk and Dairies Acts and Orders and the Diseases of Animals Acts and Orders. Material will be available to carry out tests for anthrax and tuberculosis.

1 p.m. for 1.15.—Annual luncheon in the University Union. (Members may invite guests at their own expense and are requested to inform Mr. W. Lyle Stewart of their intention to attend.)

2.30 p.m.—Annual General Meeting.

Agenda

Correspondence.
Council report.
Election of officers.
Hon. Secretary and Treasurer's report and financial statement.
Nominations.
Elections.
Induction of new President.
Presidential address.
Any other business.

5.0 p.m.—It is hoped that the gentlemen will join the ladies to tea in the University Union.

W. LYLE STEWART, *Hon. Secretary.*

NOTICE

Royal Veterinary College and Hospital

JOHN JEYES MEMORIAL SCHOLARSHIPS, 1938

THE Council invites applications for the above scholarships. The scholarships are of the total value of £100 and are awarded annually to students or former students of the Royal Veterinary College, who have not been qualified as veterinary surgeons for more than ten years. The scholarships are intended to assist the scholar to work upon some problem connected with Veterinary Medicine or Surgery, whether at home or abroad.

Applications, which should reach the Secretary, Royal Veterinary College and Hospital, not later than March 31st, 1938, must contain full particulars of the subject which it is proposed to study and the method by which such study is to be undertaken.

Camden Town,
London, N.W.1.

Professional Advertisements

These will be received up to Wednesday morning. Five lines or under, 3/6; or two insertions 5/-; for three, 6/6. Each line above five—first insertion, 8d.; after first, 4d. Average—seven words in a line.

These Advertisements will not be inserted unless prepaid, and if replies are to be received at this office an extra shilling must be included. **Replies to Box Numbers should be addressed to the appropriate Box at the Office.**

Office Address:
36, GORDON SQUARE, LONDON, W.C.1.

APPOINTMENTS VACANT

APPLICANTS for posts are requested not to enclose original testimonials when replying to advertisements. Copies answer the same purpose and cause no inconvenience if mislaid.

Royal College of Veterinary Surgeons

APPOINTMENT OF EXAMINERS

APPLICATIONS are invited for the following vacancies:—

Two Examiners in each of the following subjects:—

Physiology and Biochemistry.
Histology and Embryology.
Anatomy of Domesticated Animals.
Pharmacology and Therapeutics, Toxicology, Pharmacy.
Veterinary Hygiene, Dietetics and Animal Husbandry.

Applications, accompanied by a statement of qualifications and copies of testimonials, to be submitted not later than March 18th, 1938.

The terms offered are £4 per day while engaged on the examinations, plus 25s. per day subsistence allowance, and first-class railway fares.

For further particulars apply to the undersigned.

FRED BULLOCK,
Secretary.

10, Red Lion Square,
London, W.C.1.